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COAST FISHES
PART III. THE ANTARCTIC ZONE

By

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(Plate I; Text-figs. 1-62)

INTRODUCTION

THE collections dealt with in this, the third and final part of the report on the coast fishes, include about 1500 specimens, representing 42 species, of which five prove to be new to science,² and five others were previously unrepresented in the National Collection. The fishes belonging to the division Nototheniiformes are particularly well represented, and, together with the fine series of specimens recently obtained by the B.A.N.Z. Antarctic Research Expedition, and the rich material already in the collection of the British Museum, form an excellent basis for a new revision of this interesting group. Of the 86 species of fish recorded from the Antarctic Zone, no less than 65 (or 75 per cent) belong to the division Nototheniiformes. It may be noted that of these 65 species, 60 (or 92 per cent) are represented in the British Museum: I have been able to examine examples of three more species in Paris and elsewhere, so that only two species are included solely on the evidence of published descriptions. One of these were obtained by the Australasian Antarctic Expedition (1911-1914), and is preserved in the museum at Adelaide, South Australia; the other formed part of the collection made by the 'Gauss' (Deutsche Südpolar-Expedition, 1901-1903), and is presumably to be found in the Berlin Museum. A visit to the Muséum National d'Histoire Naturelle in Paris enabled me to examine a number of specimens obtained by the two French Antarctic Expeditions.

My thanks are due to the members of the Discovery Committee for permission to study these collections and to prepare this report. I am also indebted to Professor J. Pellegrin, Dr C. F. Angel, and Dr P. Chabanaud, for many courtesies during my short stay in Paris; to Dr V. Van Straelen, for kindly allowing me to borrow the unique types of *Gerlachea australis* and *Racovitzia glacialis* preserved in the Musée Royal d'Histoire Naturelle de Belgique; and to Dr H. Rendahl, for the loan of the unique type of *Chionodraco hamatus* preserved in the Naturhistoriska Riksmuseum at Stockholm. To all these gentlemen my thanks are due and are gratefully tendered. I am also indebted to Mr G. C. L. Bertram for allowing me to study the small collection of fishes

¹ For details as to the limits of this region see p. 87.

² Preliminary descriptions of three of these new species were published recently, see Norman, 1937, *Ann. Mag. Nat. Hist.*, (10) XX, p. 475.

made by the British Graham Land Expedition (1934-1937) and for permission to include the names in this report.

The illustrations, as in the earlier parts of this report, are the work of Lieut.-Col. W. P. C. Tenison, D.S.O.

SYSTEMATIC PART

MYXINIDAE

Myxine australis, Jenyns.

1842, *Zool. 'Beagle'*, Fish., p. 159; Norman, 1937, *Discovery Rep.*, xvi, p. 6.

Hab. Coasts of Patagonia and southern Chile; Falkland Islands; South Shetland Islands.

No specimens of this species were obtained by the expedition, but there is one from the South Shetlands in the British Museum collection. This is 230 mm. in total length, and was collected by Mr J. E. Hamilton in 1924.

RAJIDAE

Raja georgiana, sp.n.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia. From 8 cables S 81° W of Merton Rock to 1.3 miles N 7° E of Macmahon Rock. Large otter trawl, 179-235 m.: 1 female specimen, 185 mm. (width of disc 140 mm.).

Disc much broader than long, its width about $\frac{4}{5}$ of the total length; anterior margins a little undulated but not emarginate; outer angles rounded. Vent a little nearer to tip of snout than to end of tail. Snout scarcely projecting, its length rather more than $\frac{1}{7}$ width of disc; interorbital width greater than longitudinal diameter of eye and about equal to length of eye+spiracle, which is about 2 in that of snout. Internasal width about $\frac{3}{4}$ preoral length of snout. Mouth nearly straight; about 24 rows of teeth in upper jaw. Upper surface of disc more or less evenly covered with small spinules; a single praeocular spine and two postocular spines, of which the hinder is the larger; a pair of strong curved scapular spines set one behind the other; a single spine on the median line of the back midway between the second postocular and the first scapular spine, and another level with the posterior scapular spines; a series of similar spines extending in a median line from just behind the suprascapular region to the first dorsal fin. Lower surface quite smooth. Dorsal fins close to end of tail, their bases contiguous. Pale greyish-brown, mottled and spotted with yellowish-white; hinder margins of pectorals and edges of pelvics with a narrow pale border; lower surface yellowish-white, with a dusky tinge towards the hinder parts of the pectorals and pelvics.

Hab. South Georgia.

This species appears to be most nearly related to *R. macloviana*, Norman, from the Patagonian region, and *R. murrayi*, Günther, from Kerguelen, but differs from both in the shape of the disc, in the smaller eyes, in the greater internasal width, and in the

form and arrangement of the spines. It may, of course, prove to be identical with *R. arctowskii*, Dollo, the only other species of *Raja* described from the Glacial District (see below).

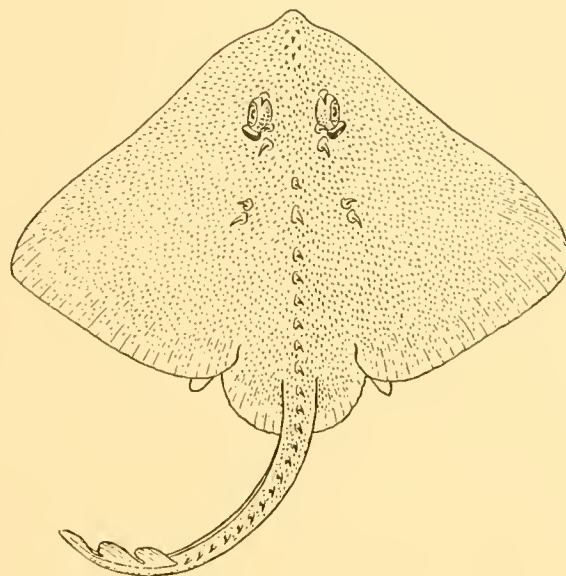


Fig. 1. *Raja georgiana*. Holotype. $\times \frac{1}{2}$.

Raja arctowskii, Dollo.

1904, *Rés. Voy. 'Belgica'*, Poiss., p. 52, pl. ix, fig. 10.

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, $61^{\circ} 25' 30''$ S, $53^{\circ} 46' 00''$ W. Large dredge, 342 m.: 6 egg-capsules.

Hab. Bellingshausen Sea; between South Shetlands and South Orkneys.

Dollo's original description of this species was based upon three egg-capsules, each 60 mm. in length (without the horns), from $70^{\circ} 15'$ S, $84^{\circ} 06'$ W; $70^{\circ} 23'$ S, $82^{\circ} 47'$ W; and $71^{\circ} 19'$ S, $87^{\circ} 37'$ W; at depths ranging from 400 to 569 metres. The fish itself has not yet been recognized.

Raja sp.

St. 599. 17. i. 31. $67^{\circ} 08'$ S, $69^{\circ} 06' 5''$ W. Large dredge, 203 m.: 1 large egg-capsule with contained embryo.

Hab. Graham Land.

The length of this capsule, without the horns, is about 200 mm., the greatest width about 80 mm. The embryo is 160 mm. in total length and measures 70 mm. across the disc. In general form the capsule is very similar to that of the European Skate, *Raja batis*, Linnaeus.

Other species of *Raja* from the Antarctic Zone are *R. murrayi*, Günther and *R. eatonii*, Günther, both from Kerguelen.

MURAENOLEPIDAE

Muraenolepis microps, Lönnberg.

Muraenolepis marmoratus microps, Lönnberg, 1905, *Wiss. Ergebn. Schwed. Südpol.-Exped.*, v (6), p. 43.

Muraenolepis microps, Regan, 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.* 1910, Zool., 1 (1), p. 1, pl. ii, fig. 2; Norman, 1937, *Discovery Rep.*, xvi, p. 58.

St. MS 10. 14. ii. 25. East Cumberland Bay, South Georgia. Small beam trawl, 26–18 m.: 1 specimen, 110 mm.

St. MS —. 28. ix. 25. Grytviken, South Georgia. From kelp root. 2 specimens, 50, 52 mm.

St. MS 68. 2. iii. 26. East Cumberland Bay, South Georgia. Large rectangular net, 220–247 m.: 1 specimen, 285 mm.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia. Large otter trawl, 179–235 m.: 4 specimens, 105–260 mm.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 120–204 m.: 2 specimens, 130, 158 mm.

St. 45. 6. iv. 26. 2·7 miles S 85° E of Jason Light, South Georgia. Large otter trawl, 270–238 m.: 6 specimens, 150–335 mm.

St. 46. 6. iv. 26. 51° 13' 00" S, 49° 50' 00" W. Large otter trawl, 270–238 m.: 1 specimen, 305 mm.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 230–250 m.: 4 specimens, 248–300 mm.

St. WS 25. 17. xii. 26. Undine Harbour (North), South Georgia. Small beam trawl, 18–27 m.: 1 specimen, 50 mm.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia. Large otter trawl, 122–136 m.: 1 specimen, 120 mm.

St. 142. 30. xii. 26. East Cumberland Bay, South Georgia. Large otter trawl, 88–273 m.: 1 specimen, 142 mm.

St. 148. 9. i. 27. Off Cape Saunders, South Georgia. Large otter trawl, 132–148 m.: 2 specimens, 235, 290 mm.

St. WS 424. 14. iv. 29. 54° 34' 00" S, 38° 49' 00" W. 1 m. tow-net, oblique, 95–0 m.: 1 specimen, 39 mm.

St. —. 29. i. 35. Grytviken, South Georgia. Large gauze fish trap. 1 specimen, 320 mm.

St. 1660. 27. i. 36. 74° 46' 4" S, 178° 23' 4" E. Large otter trawl, 351 m.: 1 specimen, 220 mm.

Depth of body $4\frac{3}{4}$ to 6 in the length, length of head $4\frac{1}{2}$ to $5\frac{1}{4}$. Snout $1\frac{1}{2}$ times to twice as long as eye, diameter of which is 4 (young) to 6 in length of head, equal to or less than interocular width, and greater than interorbital width. Barbel $\frac{1}{5}$ or $\frac{1}{6}$ length of head. Maxillary extending to below anterior part of eye in young, to middle of eye or beyond in larger specimens. Dorsal filament varying from $\frac{2}{3}$ to about twice diameter of eye, inserted above or a little behind base of pectoral. Origin of anal only a little nearer to end of snout than to base of caudal. Length of pectoral $\frac{1}{2}$ to $\frac{3}{5}$, of pelvic $\frac{3}{4}$ to $\frac{5}{6}$ that of head; pelvic inserted well in advance of base of pectoral. Uniformly greyish or brownish.

Hab. Burdwood Bank, south of the Falkland Islands; South Georgia; South Sandwich Islands; South Victoria Land.

This species was originally described from 4 specimens, 140 to 335 mm. in total length, from Cumberland Bay, South Georgia, at depths of 20 to 100 metres.

Examination of this fine series of specimens shows that *M. microps* is very closely related to *M. marmoratus*, Günther, from Kerguelen, and may even prove to be identical with that species. Comparison of examples of equal size, however, suggests that *M. marmoratus* has a smaller head, a slightly larger eye, and perhaps a shorter dorsal filament.

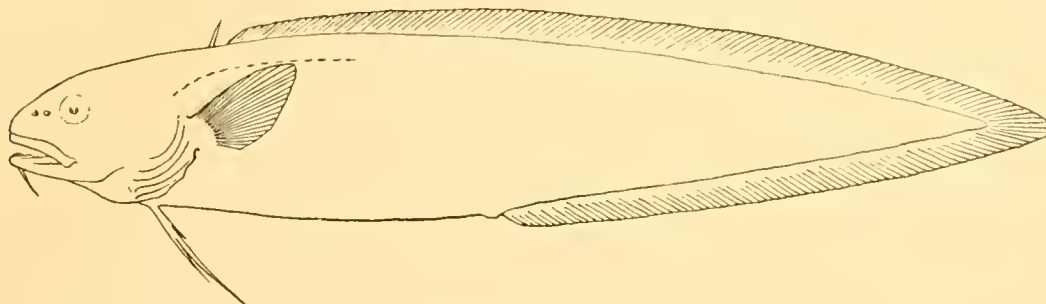


Fig. 2. *Muraenolepis microps*. $\times \frac{1}{2}$.

The only other species of *Muraenolepis* from the Antarctic Zone is *M. microcephalus*, Norman, known only from the unique holotype, 125 mm. in total length, from $63^{\circ} 51' \text{ S.}$, $54^{\circ} 16' \text{ E}$ (2000 metres of wire), collected by the B.A.N.Z. Antarctic Research Expedition. This form appears to be most nearly related to *M. orangiensis*, Vaillant, from the Patagonian region. I have given a key to the four known species of *Muraenolepis* elsewhere.¹

REVISION OF THE ANTARCTIC NOTOTHENIIFORMES

Regan's revision published in 1913,² together with his subsequent report on the rich material collected by the 'Terra Nova',³ has placed the taxonomy of this group of fishes on a sound basis. In more recent years, however, the Australasian Antarctic Expedition of 1911–1914, and the British, Australian, New Zealand Antarctic Research Expedition of 1929–1931, together with the important collections of the Discovery Committee, have brought to light a number of additional forms, and have added considerably to our knowledge of the fish fauna of the Antarctic Zone.⁴ The problems raised by the study of this material have led me to undertake a new revision of these fishes, which, although it amplifies that of Regan, only modifies his conclusions in certain comparatively unimportant details.

Division NOTOTHENIIFORMES

Percoid fishes, normally without pungent fin-spines, with the spinous dorsal, when developed, shorter than the long soft dorsal and anal, the principal caudal rays reduced in number (usually 14), the pectorals typically broad-based, and the pelvics jugular,

¹ Norman, 1937. *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, 1, p. 69.

² *Trans. R. Soc. Edinburgh*, XLIX, pp. 249–289.

³ 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.* 1910, Zool. 1 (1), pp. 1–54.

⁴ This Zone includes the Glacial District and the Kerguelen District, see Regan, 1914, *l.c.*, pp. 33–36.

separated by an interspace, and each formed of a spine and 5 branched rays. There is a single nostril on each side. In osteological characters the more generalized forms are very similar to the Perciformes, but the structure and position of the radials of the pectoral fins are highly characteristic. The radials are 3 in number, rather large flat plates; all or 2 are inserted on the hypocoracoid, and the lowest is the narrowest and has its lower edge in contact with the metapterygoid process. [After Regan.]

Five families, of which one (Bovichthyidae) does not occur in the Antarctic Zone.

Synopsis of the Antarctic Families

- I. Palatines and pterygoids normally developed; ribs present.
 - A. Spinous dorsal fin present; mouth protractile.
 1. Operculum normal; body scaly; gill-membranes forming a fold across the isthmus
1. *Nototheniidae*.
 2. Operculum hooked upwards posteriorly, its upper edge deeply concave; body naked; gill-membranes broadly united to isthmus 2. *Harpagiferidae*.
 - B. Spinous dorsal fin absent; mouth usually non-protractile 3. *Bathydraconidae*.
- II. Palatine in great part ligamentous; no mesopterygoid; mouth not protractile; snout produced and depressed; ribs not ossified 4. *Chaenichthyidae*.

Family NOTOTHENIIDAE

Body scaly. Snout not or only a little produced. Mouth protractile; palatines and pterygoids normally developed; palate toothless. Gill-membranes forming a fold across the isthmus; operculum normal. Spinous dorsal fin present. All three radials situated on the hypocoracoid. Ribs present.

Five genera, of which one (*Eleginops*) does not occur in the Antarctic Zone.

Key to the Antarctic Genera

- I. Foramen partly bordered by hypocoracoid (fig. 3 B) 1. *NOTOTHENIA*.
- II. Hypercoracoid enclosing its foramen (fig. 3 A).
 - A. Scales not very thin, those of upper lateral line with tubules, those of lower lateral line with tubules or pits; two lateral lines; skeleton well ossified; most of the praecaual vertebrae with parapophyses
 1. Teeth in bands, villiform; snout not much longer than eye 2. *TREMATOMUS*.
 2. Teeth in upper jaw biserial, those of outer row enlarged, spaced, canine-like; a group of stronger teeth on each praemaxillary; teeth of lower jaw uniserial, spaced, canine-like; snout much longer than eye 3. *DISSOSTICHUS*.
 - B. Scales very thin, cycloid, those of the 3 lateral lines each with a notched hinder margin and with a vertical row of 3 shallow pits; skeleton feebly ossified; only the posterior praecaual vertebrae with parapophyses 4. *PLEURAGRAMMA*.

Genus NOTOTHENIA

Notothenia, Richardson, 1844, *Zool. 'Erebus' and 'Terror'* (Fish.), p. 5; Günther, 1860, *Cat. Fish.*, 11, p. 260; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 264. Type *Notothenia coriiceps*, Richardson.

Macronotothen, Gill, 1862, *Proc. Acad. N.S. Philad.* (1861), p. 520. Type *Notothenia?* *rossii*, Richardson.

? *Pagothenia*, Nichols and LaMonte, 1936, *Amer. Mus. Novit.*, 839, p. 2. Type *Pagothenia antarctica*, Nichols and LaMonte.

Body scaly; two lateral lines with tubular or pitted scales. Mouth of moderate size or rather large; teeth usually in bands, but sometimes irregularly bi- or tri-serial with some of the teeth of the outer series enlarged and canine-like. Snout not much longer than the eye. Gill-membranes united, free or forming a free fold across the isthmus. Pectoral fin rounded or vertically truncated. Skeleton well ossified; vertebrae 44 to 54 (16-20+27-34); most of the praecaudals with parapophyses to which the ribs and epipleurals are attached; hypercoracoid foramen margined below by the hypocoracoid.

Coasts of the Antarctic Continent and northwards to Patagonia, Chile, the Falkland Islands, South Georgia, Bouvet Island, Marion Islands, Crozet Islands, Kerguelen, Macquarie Island, southern New Zealand, and Chatham Islands.

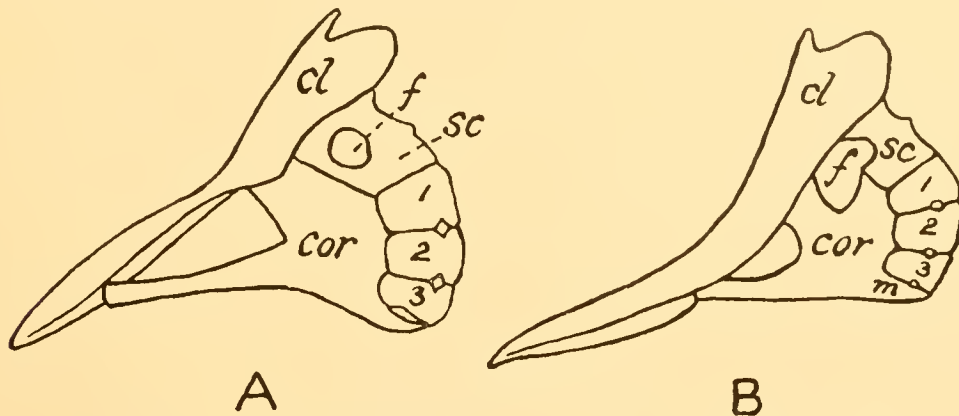


Fig. 3. Pectoral fin-skeleton of A, *Trematomus newnesi*; B, *Notothenia coriiceps*. *cl*, cleithrum; *sc*, hypercoracoid (scapula); *f*, foramen; *cor*, hypocoracoid; *m*, metapterygoid process; 1, 2, 3, radials. (After Regan.)

Key to the Antarctic Species

- I. Cheeks and opercles largely scaled, the scaling extending downwards for at least half the depth of the operculum; upper surface of head scaly (except in *N. nudifrons*).
 - A. Pectoral with 21 to 25 rays; dorsal IV-VIII, 31-41; anal 30-40.
 1. Snout and praeorbital scaly (except in young); 12 to 17 gill-rakers on lower part of anterior arch.
 - a. Upper lateral line of 39 to 47 tubular scales; similar scales generally present in lower lateral line; depth 4 to $4\frac{1}{2}$ in length.
 - α. Eye 3 to $3\frac{1}{2}$, interorbital width 9 to 12 in head; dorsal IV-V, 36-37; anal 32; 15 to 18 tubular scales in lower lateral line ... 1. *squamifrons*.
 - β. Eye 3, interorbital width 9 in head; dorsal VI, 34; anal 30; 4 to 8 tubular scales in lower lateral line ... 2. *macrophthalma*.
 - γ. Eye $2\frac{2}{3}$ to $3\frac{1}{3}$, interorbital width 14 to 16 in head; dorsal V-VI, 36-38; anal 32-33; usually 9 to 17 tubular scales in lower lateral line ... 3. *kempi*.
 - b. Upper lateral line of 46 to 58 tubular scales; no tubular scales in lower lateral line; depth $4\frac{1}{3}$ to $5\frac{3}{4}$ in length; dorsal IV-VI, 35-41; anal 36-40 ... 4. *larseni*.

2. Praeorbital naked; snout naked or scaly; 8 to 13 gill-rakers on lower part of anterior arch.
 - a. 30 to 42 tubular scales in lower lateral line (except in young); pelvics shorter than pectorals, scarcely reaching as far as vent; dorsal VII-VIII, 31-34; anal 31-34 ... 5. *gibberifrons*.
 - b. Lower lateral line without tubular scales; pelvics longer than pectorals, extending as far as vent or anal fin.
 - α . Upper surface of head scaly; dorsal IV-V, 34-37; anal 33-35 6. *misops*.
 - β . Upper surface of head naked; dorsal IV-VI, 36-40; anal 34-36 7. *nudifrons*.
- B. Pectoral with 19 to 21 rays; dorsal V-VII, 28-31; anal 27-31.
 1. Opercles fully scaled; pelvics reaching as far as vent; 54 to 60 scales in a longitudinal series; upper lateral line of 36 to 39 tubular scales ... 8. *acuta*.
 2. Opercles scaly above, naked below; pelvics not reaching as far as vent; 46 to 52 scales in a longitudinal series; upper lateral line of 26 to 35 tubular scales.
 - a. Interorbital width 15 to 20 in head; dorsal V-VIII, 28-30; anal 29-31. 9. *angustifrons*.
 - b. Interorbital width 10 in head; dorsal VII, 29; anal 27 ... 10. *marionensis*.
- II. Opercles scaled only on upper part of operculum; upper surface of head naked.
 - A. Anal of 26 to 34 rays.
 1. Interorbital width 5 to $6\frac{1}{2}$ in head; pectoral with 20 or 21 rays; cheek scaly below and behind eye, its lower $\frac{1}{2}$ (young) or $\frac{1}{4}$ (adult) naked; dorsal IV-VI, 33-36; anal 30-34; scales ctenoid on body ... 11. *cyanobrancha*.
 2. Interorbital width $3\frac{2}{3}$ to 5 in head; pectoral with 17 or 18 rays; cheek scaly behind eye; dorsal III-VII, 35-40; anal 27-31; scales cycloid on body 12. *coriiceps*.
 3. Interorbital width $2\frac{3}{4}$ to $3\frac{3}{4}$ in head; pectoral with 21 to 23 rays; cheek scaly behind and to some extent below eye; dorsal IV-VII, 32-36; anal 26-30; scales cycloid on body ... 13. *rossii*.
 - B. Anal of 22 to 25 rays; interorbital width $2\frac{1}{2}$ to 4 in head.
 1. Dorsal III-VI, 29-31; 50 to 60 scales in a lateral longitudinal series 14. *macrocephala*.
 2. Dorsal VI-VIII, 26-27; 84 to 92 scales in a lateral longitudinal series 15. *colbecki*.

It has proved impossible to ascertain the true position of *Notothenia phocae*, Richardson (1844, *Zool. 'Erebus' and 'Terror'* (Fish.), p. 8), and this must remain a doubtful species. The examples mentioned by Richardson as having been preserved in spirits no longer exist, and I have been unable to trace the drawing said to have been made by Dr Hooker. The fish were all taken at 65° S, circa 155° W, from the stomach of a seal, and ranged in size from 65 to 170 mm. in length (without the caudal fin).

Notothenia squamifrons, Günther.

Notothenia squamifrons, Günther, 1880, *Shore Fish. 'Challenger'*, p. 16, pl. viii, fig. C; Regan, 1913, *t.c.*, p. 270.

Depth of body $4\frac{1}{2}$ in the length, length of head $3\frac{3}{5}$. Snout shorter than eye, diameter of which is 3 to $3\frac{1}{2}$ in length of head; interorbital width 9 to 12. Jaws equal anteriorly; maxillary extending to below anterior $\frac{1}{4}$ of eye; upper surface and sides of head, including snout and praeorbital, scaly; about 5 rows of scales between the eyes; 14 to 16 gill-rakers on lower part of anterior arch. Scales on body cycloid or feebly ctenoid; 55 in a longitudinal series from above base of pectoral to caudal, 44 or 45 in upper

lateral line, which terminates below end of dorsal, or just behind it, 15 to 18 in lower lateral line. Dorsal IV-V, 36-37. Anal 32. Pectoral with 24 or 25 rays, $\frac{3}{4}$ length of head, rather shorter than pelvics, which reach the anal. Caudal peduncle deeper than long. Body with irregular cross-bars; cheek with two oblique stripes; spinous dorsal partly blackish.

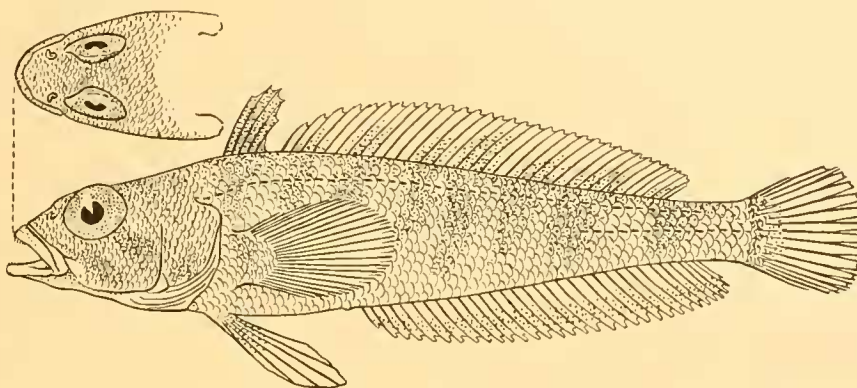


Fig. 4. *Notothenia squamifrons*. $\times \frac{3}{4}$.

Hab. Kerguelen.

Known only from the types of the species, two specimens, 110 and 150 mm. in total length.

Notothenia macrophthalmia, Norman.

Notothenia macrophthalmia, Norman, 1937, *Discovery Rep.*, xvi, p. 68, fig. 30.

Very closely related to the preceding species, but diameter of eye 3 in length of head; 3 rows of scales between the eyes; 12 gill-rakers on lower part of anterior arch; only 4 to 8 tubular scales in lower lateral line; dorsal VI, 34; anal 30.

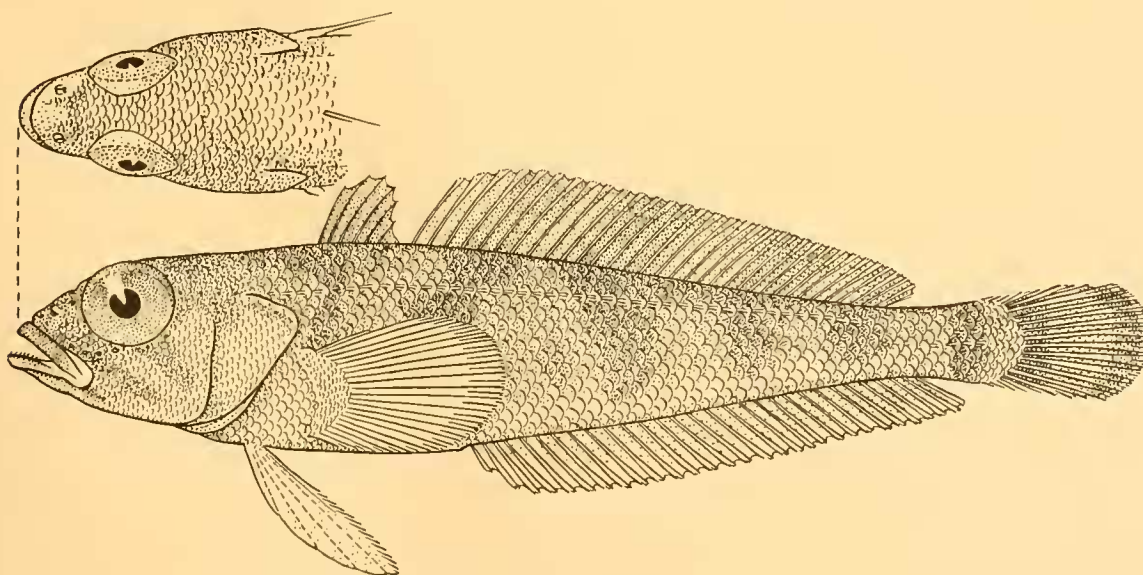


Fig. 5. *Notothenia macrophthalmia*. Holotype. $\times \frac{4}{5}$.

Hab. Near the Burdwood Bank, south of the Falkland Islands.

A full description of this species, which is known only from the unique holotype (190 mm. in total length), has been given in a previous report, but, since it seems to be more nearly related to Antarctic than to Patagonian species of *Notothenia*, I have included it again here.

***Notothenia kempi*, Norman.**

Notothenia kempi, Norman, 1937, *Ann. Mag. Nat. Hist.*, (10) xx, p. 475.

St. 180. 11. ii. 27. 1.7 miles W of North point of Gand Island, Schollaert Channel, Palmer Archipelago. Large dredge, 160 m.: 1 specimen, 88 mm.

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago. Large otter trawl, with nets (4 mm. and 7 mm. mesh) attached, 160–335 m.: 8 specimens, 80–235 mm.

St. 182. 14. iii. 27. Schollaert Channel, Palmer Archipelago. Large otter trawl, 278–500 m.: 1 specimen, 210 mm. Holotype.

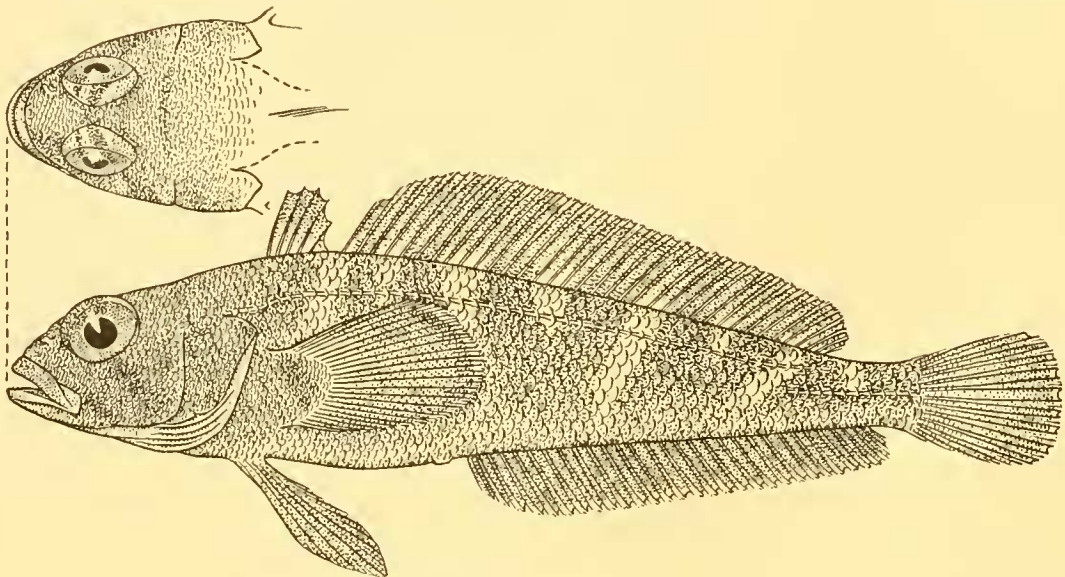


Fig. 6. *Notothenia kempi*. Holotype. $\times \frac{5}{8}$.

Depth of body 4 to $4\frac{4}{5}$ in the length, length of head $3\frac{2}{5}$ to $3\frac{3}{5}$. Snout shorter than eye, diameter of which is $2\frac{2}{3}$ to $3\frac{1}{3}$ in length of head; interorbital width 14 to 16. Jaws equal anteriorly; maxillary extending to below anterior $\frac{1}{4}$ of eye; upper surface and sides of head, including snout and preorbital, scaly in adult; snout and preorbital partly or entirely naked in young; upper surface of eyeball scaly in adult; 2 or 3 rows of scales between the eyes; 12 to 14 gill-rakers on lower part of anterior arch. Scales on body ctenoid; 55 to 59 in a longitudinal series from above base of pectoral to caudal; 40 to 47 in upper lateral line, which terminates below posterior rays of dorsal or a little farther back, 9 to 17 in lower lateral line. Dorsal V–VI, 36–38. Anal 32–33. Pectoral with about 25 rays, $\frac{3}{4}$ to $\frac{4}{5}$ length of head, as long as or a little longer than pelvics, which reach to or nearly to vent in adults, sometimes beyond in young. Caudal subtruncate or a little rounded; caudal peduncle deeper than long. Body with broad irregular

cross-bars, which extend on to the base of the dorsal fin; cheek with two oblique dark stripes; spinous dorsal with a black blotch; soft dorsal with a submarginal blackish band, which in adults covers the greater part of the fin; anal fin blackish in adults, the margin narrowly white; the whole anal fin pale in young; caudal, pectorals and pelvics all more or less dusky in adults, with somewhat narrow pale margins.

Hab. Palmer Archipelago, Graham Land.

This well-marked species was named after Dr Stanley W. Kemp, F.R.S., the former Director of Research.

***Notothenia larseni*, Lönnberg.**

Notothenia larseni, Lönnberg, 1905, *Wiss. Ergebn. Schwed. Südpol.-Exped.*, v (6), pp. 31, 46, pl. i, fig. 3, pl. ii, fig. 6; Regan, 1913, *t.c.*, p. 272.

St. MS 67. 28. ii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 38 m.: 1 specimen, 43 mm.

St. MS 71. 9. iii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 110–60 m.: 21 specimens, 60–80 mm.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia. Large otter trawl, 179–235 m.: 6 specimens, 65–102 mm.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 120–204 m.: numerous specimens, 52–195 mm.

St. 45. 6. iv. 26. 2.7 miles S 85° E of Jason Light, South Georgia. Large otter trawl, 238–270 m.: 135 specimens, 60–185 mm.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, with tow-net attached, 230–250 m.: 14 specimens, 52–104 mm.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia. Large otter trawl, 122–136 m.: 8 specimens, 60–123 mm.

St. 142. 30. xii. 26. East Cumberland Bay, South Georgia. Net (7 mm. mesh) attached to back of trawl, 88–273 m.: 3 specimens, 115–145 mm.

St. 144. 5. i. 27. Off mouth of Stromness Harbour, South Georgia. Net (4 mm. mesh) attached to back of trawl, 155–178 m.: 3 specimens, 60–86 mm.

St. WS 42. 7. i. 27. 54° 41' 45" S, 36° 47' 00" W. 1 m. tow-net, horizontal, 198 m.: 1 specimen, 163 mm.

St. 148. 9. i. 27. Off Cape Saunders, South Georgia. Large otter trawl, with net (4 mm. mesh) attached, 132–148 m.: 13 specimens, 58–104 mm.

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia. Large otter trawl, 200–234 m.: 4 specimens, 150–170 mm.

St. WS 62. 19. i. 27. Wilson Harbour, South Georgia. Small beam trawl, 26–83 m.: 45 specimens, 57–64 mm.

St. 156. 20. i. 27. 53° 51' 00" S, 36° 21' 30" W. Large dredge, 200–236 m.: 1 specimen, 160 mm.

St. 160. 7. ii. 27. Near Shag Rocks, 53° 43' 40" S, 40° 57' 00" W. Large dredge, 177 m.: 2 specimens, 70, 72 mm.

St. 167. 20. ii. 27. Off Signy Island, South Orkneys. Net (7 mm. mesh) attached to back of trawl, 244–344 m.: 13 specimens, 123–176 mm.

St. 175. 2. iii. 27. Bransfield Strait, South Shetlands. Large dredge, 200 m.: 2 specimens, 170, 170 mm.

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago. Nets (4 mm. and 7 mm. mesh) attached to back of trawl, 160–335 m.: 17 specimens, 100–153 mm.

St. WS 165. 1. iii. 28. $53^{\circ}44'S$, $38^{\circ}46'W$. 70 cm. tow-net, oblique, 133-0 m.: 1 specimen, 93 mm.

St. WS 179. 7. iii. 28. $55^{\circ}08'00''S$, $35^{\circ}20'00''W$. 1 m. tow-net, oblique, 112-0 m.: 1 specimen, 72 mm.

St. WS 358. 13-14. i. 29. $55^{\circ}02'30''S$, $35^{\circ}18'00''W$. 1 m. tow-net, oblique, 85-0 m.: 1 specimen, 53 mm.

St. 341. 5-6. ii. 30. $54^{\circ}43'S$, $36^{\circ}42\frac{1}{2}'W$. 1 m. tow-net, oblique, 111-0 m.: 1 specimen, 172 mm.

St. 366. 6. iii. 30. 4 cables S of Cook Island, South Sandwich Islands. Large dredge, 155-322 m.: 10 specimens, 52-110 mm.

St. 371. 14. iii. 30. 1 mile E of Montagu Island, South Sandwich Islands. Large otter trawl, with nets (4 mm. and 7 mm. mesh) attached, 99-161 m.: 17 specimens, 65-195 mm.

St. 456. 18. x. 30. 1 mile E of Bouvet Island. Large dredge, 40-45 m.: 40 specimens, 90-190 mm.

St. 474. 12. xi. 30. 1 mile W of Shag Rocks, South Georgia. Large dredge, 199 m.: 4 specimens, 63-70 mm.

St. 476. 12. xi. 30. 1 mile N of Shag Rocks, South Georgia. 1 m. tow-net, oblique, 165 m.: 6 specimens, 63-72 mm.

St. 1873. 13. xi. 36. $61^{\circ}20'8'S$, $54^{\circ}04'2'W$. Rectangular dredge, with Russell net, 117 m.: 1 specimen, 200 mm.; 210-180 m.: 4 specimens, 85-190 mm.

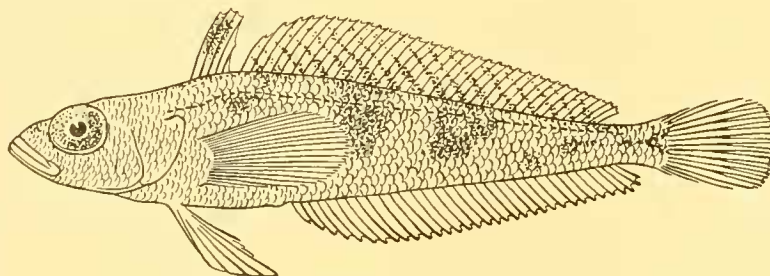


Fig. 7. *Notothenia larseni*. $\times \frac{1}{2}$.

Depth of body $4\frac{1}{3}$ to $5\frac{3}{4}$ in the length, length of head $3\frac{1}{3}$ to nearly 4. Snout shorter than eye, diameter of which is $2\frac{4}{5}$ to $3\frac{1}{4}$ in length of head; interorbital width 11 to 13. Jaws equal anteriorly; maxillary extending to or a little beyond vertical from anterior margin of eye; upper surface and sides of head, including snout and preorbital, scaly in adult, snout and preorbital often partly or entirely naked in young; 14 to 17 gill-rakers on lower part of anterior arch. Scales on body ctenoid; 58 to 65 in a longitudinal series from above base of pectoral to caudal; 46 to 58 in upper lateral line, which extends beyond end of dorsal; lower lateral line without tubular scales. Dorsal IV-VI, 35-41. Anal 36-40. Pectoral with 23 to 26 rays, about $\frac{4}{5}$ length of head, a little longer than pelvics, which just reach the anal. Caudal subtruncate or a little rounded; caudal peduncle about as long as deep. Body with some irregular oblique dark cross-bars, which in the young tend to break up into 3 or 4 series of alternating spots or blotches; distal part of spinous dorsal with a black blotch; soft dorsal with oblique dark stripes or series of spots; anal plain or similarly marked; caudal often with indistinct dark cross-bars, sometimes dusky distally; pectoral more or less dusky, with pale posterior margin.

Hab. Palmer Archipelago, Graham Land; South Shetlands; South Orkneys; South Georgia; South Sandwich Islands; Bouvet Island.

Lönnberg described this species from 8 specimens: 1 from the Shag Rocks, 5 from outside Cumberland Bay, South Georgia, and 2 from south of Snow Hill; at depths ranging from 250 to 310 metres. It was named after Capt. C. A. Larsen, the chief navigator of the Swedish Antarctic Expedition. Although nearly the commonest species obtained in this region by the Discovery Committee, *N. larseni* was not previously represented in the British Museum collection.

***Notothenia gibberifrons*, Lönnberg.**

Notothenia gibberifrons, Lönnberg, 1905, *Wiss. Ergebn. Schwed. Südpol.-Exped.*, v (6), p. 33, pl. iii, fig. 10; Vaillant, 1906, *Bull. Mus. Paris*, 1906, No. 3, p. 139; 1906, *Expéd. Antarct. Franç.* (1903-1905), Poiss., p. 33; Lönnberg, 1906, *K. Svensk. Vet.-Akad. Handl.*, xL (5), p. 93; Regan, 1913, *t.c.*, pp. 240, 271.

Notothenia acuta, Vaillant, 1906, *t.c.*, p. 139; 1906, *t.c.*, p. 31.

Notothenia vaillanti, Regan, 1913, *t.c.*, p. 272.

St. MS 24. 13. iv. 25. East Cumberland Bay, South Georgia. Small beam trawl, 30 m.: 2 specimens, 33, 38 mm.

St. MS 32. 1. v. 25. East Cumberland Bay, South Georgia. Small beam trawl, 40 m.: 44 specimens, 39-210 mm.

St. —. Feb., 1926. Cumberland Bay, South Georgia. Long line: 1 specimen, 223 mm.

St. MS 63. 24. ii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 23 m.: 1 specimen, 145 mm.

St. MS 67. 28. ii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 38 m.: 2 specimens, 65, 85 mm.

St. MS 71. 9. iii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 110-60 m.: 3 specimens, 130-225 mm.

St. MS 74. 17. iii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 22-40 m.: 2 specimens, 33, 38 mm.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia. Large otter trawl, 179-235 m.: 23 specimens, 38-400 mm.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 120-204 m.: 30 specimens, 35-280 mm.

St. 45. 6. iv. 26. 2.7 miles S 85° E of Jason Light, South Georgia. Large otter trawl, 270-238 m.: 27 specimens, 36-335 mm.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 230-250 m.: 3 specimens, 61-300 mm.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia. Large otter trawl, 122-136 m.: 4 specimens, 68-145 mm.

St. WS 62. 19. i. 27. Wilson Harbour, South Georgia. Small beam trawl, 26-83 m.: 72 specimens, 47-100 mm.; small beam trawl, 15-45 m.: 3 specimens, 50-53 mm.

St. 167. 20. ii. 27. Off Signy Island, South Orkneys. Net (7 mm. mesh) attached to back of trawl, 244-344 m.: 16 specimens, 142-270 mm.

St. 189. 23-25. iii. 27. Port Lockroy, Wiencke Island, Palmer Archipelago. Large fish trap, 70 m.: 6 specimens, 265-375 mm.

St. WS 358. 13-14. i. 28. 55° 02' 30" S, 35° 18' 00" W. 1 m. tow-net, oblique, 85-0 m.: 1 specimen, 57 mm.

St. 371. 14. iii. 30. 1 mile E of Montagu Island, South Sandwich Islands. Large otter trawl, with nets (4 mm. and 7 mm. mesh) attached, 99-161 m.: 6 specimens, 170-210 mm.

St. 393 c. 8. v. 30. $54^{\circ} 17' S$, $35^{\circ} 30' W$. 1 m. tow-net, oblique, 121–187 m.: 1 specimen, 39 mm. No data. 2 specimens, 325, 330 mm.

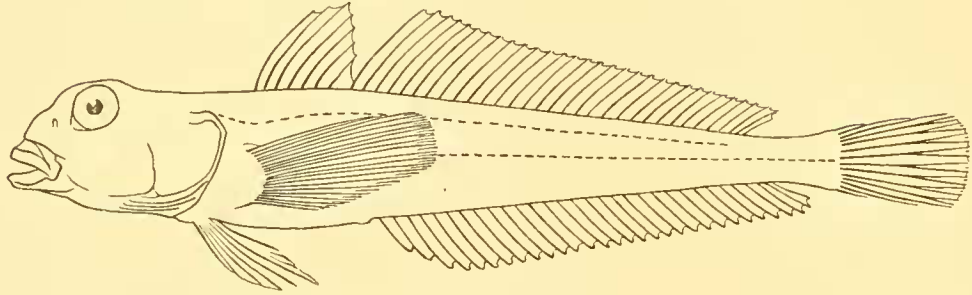


Fig. 8. *Notothenia gibberifrons*. $\times \frac{2}{3}$.

Depth of body 5 to $5\frac{1}{2}$ in the length, length of head $3\frac{1}{4}$ to $3\frac{4}{5}$. Snout as long as or rather shorter than eye, diameter of which is 3 (young) to $4\frac{2}{3}$ in length of head; inter-orbital width 12 to 16. Jaws equal anteriorly; maxillary not or only just reaching vertical from anterior margin of eye; cheeks, opercles, upper surface of head, and greater part of snout scaly in adult, but praeorbitals naked; 8 to 11 gill-rakers on lower part of anterior arch. Scales on body ctenoid; 54 to 60 in a longitudinal series from above base of pectoral to caudal; 34 to 47 (51) in upper lateral line, which ends below posterior part of dorsal; 30 to 42 in lower lateral line, which generally extends forward to or beyond level of tip of pectoral; lower lateral line usually without tubular scales in young. Dorsal VII–VIII, 31–34. Anal 31–34. Pectoral with 21 or 22 rays, $\frac{4}{5}$ to $\frac{7}{8}$ length of head, longer than pelvics, which reach vent or origin of anal in young, but not or scarcely as far as vent in adult. Caudal rounded or subtruncate; caudal peduncle about as long as deep. Upper part of head and body irregularly spotted and blotched, but only rarely with traces of darker cross-bars; young with irregular cross-bars, broken up into 3 or 4 series of alternating spots; usually a more distinct Y-shaped mark at base of caudal; dorsals, caudal, pectorals and sometimes the pelvics with series of dark spots forming bars; anal pale.

Hab. Palmer Archipelago, Graham Land; South Shetlands; South Orkneys; South Sandwich Islands; South Georgia.

This species was originally described from numerous specimens, all from South Georgia, at depths ranging from 20 to 310 metres. According to Lönnberg, it is a sluggish bottom fish, but the Discovery Committee obtained some young examples in tow-nets. Lönnberg records a specimen 460 mm. in total length.

The large specimen, 410 mm. in total length, described by Vaillant as *Notothenia acuta*, has been examined by me in the Paris Museum (No. 06–132), and undoubtedly belongs to this species. There are also two small specimens (No. 06–131), 53 and 56 mm. in total length, the larger of which is the holotype of *N. vaillanti*, Regan. These prove to be young *N. gibberifrons*, in which the snout is always more or less naked and the tubular scales in the lower lateral line are usually absent. The 'Français' obtained these specimens from Booth Wandell Island and Wiencke Island, at depths varying from 20 to 40 metres.

Notothenia mizops, Günther.

Notothenia mizops, Günther, 1880, *Shore Fish. 'Challenger'*, p. 16, pl. viii, fig. D; Regan, 1913, *t.c.*, p. 273; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, 1, p. 61.

Depth of body $4\frac{1}{3}$ to $4\frac{3}{4}$ in the length, length of head 3 (young) to 4. Snout much shorter than eye, diameter of which is 3 to $3\frac{1}{2}$ in length of head; interorbital width about 15. Jaws equal anteriorly; maxillary extending to below anterior $\frac{1}{4}$ or $\frac{1}{3}$ of eye; cheeks, opercles occiput and interorbital region scaly; 9 to 13 gill-rakers on lower part of anterior arch. Scales on body ctenoid; 48 to 55 in a longitudinal series from above base of pectoral to caudal; 30 to 38 in upper lateral line, which ends below posterior part of dorsal; lower lateral line without tubular scales. Dorsal IV-V, 34-37. Anal 33-35. Pectoral with 21 or 22 rays, $\frac{2}{3}$ to $\frac{7}{8}$ length of head, shorter than pelvics, which extend to, nearly to, or beyond origin of anal. Caudal rounded; caudal peduncle deeper than long. Body with two series of large, partly confluent, irregular blackish spots; cheek with two oblique dark stripes; a blackish spot on spinous dorsal; soft dorsal, caudal and anal with or without series of dark spots.

Hab. Kerguelen.

The above description is based upon the types of the species, 5 specimens, 70 to 170 mm. in total length, from off Christmas Harbour and Howes Foreland, 220 metres; and upon 10 specimens, 40 to 145 mm. in total length, collected by the B.A.N.Z. Antarctic Research Expedition, at depths ranging from 20 to 150 metres.

Notothenia nudifrons, Lönnberg.

Notothenia mizops var. *nudifrons*, Lönnberg, 1905, *Wiss. Ergebn. Schwed. Südpol.-Exped.*, v (6), pp. 30, 45, pl. i, fig. 2; Lönnberg, 1906, *K. Svensk. Vet.-Akad. Handl.*, xl (5), p. 92; Roule and Despax, 1911, *Bull. Mus. Paris*, 1911, No. 5, p. 278; Roule, Angel and Despax, 1913, *Deux. Expéd. Antarct. Franç.* (1908-1910), Poiss., p. 4.

Notothenia mizops, Vaillant, 1906, *Bull. Mus. Paris*, 1906, No. 3, p. 139; 1906, *Expéd. Antarct. Franç.* (1903-1905), Poiss., p. 30.

Notothenia nudifrons, Regan, 1913, *t.c.*, pp. 240, 273.

St. MS 6. 14. ii. 25. East Cumberland Bay, South Georgia. Small beam trawl, 24-30 m.: 4 specimens, 38-220 mm.

St. MS 10. 14. ii. 25. East Cumberland Bay, South Georgia. Small beam trawl, 26-18 m.: 11 specimens, 47-133 mm.

St. MS 12. 17. ii. 25. East Cumberland Bay, South Georgia. Small beam trawl, 25 m.: 1 specimen, 105 mm.

St. MS 25. 13. iv. 25. East Cumberland Bay, South Georgia. Small beam trawl, 36 m.: 2 specimens, 50, 80 mm.

St. MS 32. 1. v. 25. East Cumberland Bay, South Georgia. Small beam trawl, 40 m.: 2 specimens, 94, 142 mm.

St. MS 33. 1. v. 25. 1 cable E of Hobart Rock, East Cumberland Bay, South Georgia. Small beam trawl, 40 m.: 1 specimen, 95 mm.

St. MS 62. 24. ii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 31 m.: 6 specimens, 40-84 mm.

St. MS 63. 24. ii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 23 m.: 6 specimens, 37-67 mm.

St. MS 67. 28. ii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 38 m.: 8 specimens, 42–185 mm.

St. MS 71. 9. iii. 26. East Cumberland Bay, South Georgia. Small beam trawl, with tow-net of coarse silk attached, 110–60 m.: 26 specimens, 42–150 mm.

St. MS 74. 17. iii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 22–40 m.: 18 specimens, 14–158 mm.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia. Large otter trawl, 179–235 m.: 3 specimens, 130–150 mm.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 120–204 m.: 3 specimens, 52–66 mm.

St. WS 25. 17. xii. 26. Undine Harbour (North), South Georgia. Small beam trawl, 18–27 m.: 45 specimens, 40–145 mm.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia. Large otter trawl, 122–136 m.: 14 specimens, 45–155 mm.

St. 141. 29. xii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 17–27 m.: 3 specimens, 85–195 mm.

St. 144. 5. i. 27. Off mouth of Stromness Harbour, South Georgia. Net (4 mm. mesh) attached to back of trawl, 155–178 m.: 5 specimens, 53–90 mm.

St. 145. 7. i. 27. Stromness Harbour, South Georgia. Net (4 mm. mesh) attached to back of trawl, 26–35 m.: 14 specimens, 55–170 mm.

St. 148. 9. i. 27. Off Cape Saunders, South Georgia. Large otter trawl, with net (4 mm. mesh) attached, 132–148 m.: 17 specimens, 47–160 mm.

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia. Large otter trawl, 200–234 m.: 3 specimens, 163–176 mm.

St. WS 62. 19. i. 27. Wilson Harbour, South Georgia. Small beam trawl, 26–83 m.: 6 specimens, 52–130 mm.

St. 156. 20. i. 27. $53^{\circ} 51' 00''$ S, $36^{\circ} 21' 30''$ W. Large dredge, 200–236 m.: 3 specimens, 62–128 mm.

St. 160. 7. ii. 27. Near Shag Rocks, $53^{\circ} 43' 40''$ S, $40^{\circ} 57' 00''$ W. Large dredge, 177 m.: 5 specimens, 73–153 mm.

St. 163. 17. ii. 27. Paul Harbour, Signy Island, South Orkneys. Small beam trawl, 18–27 m.: 1 specimen, 70 mm.

St. 173. 28. ii. 27. Port Foster, Deception Island, South Shetlands. Small beam trawl, 5–60 m.: 3 specimens, 73–142 mm.

St. 184. 15–16. iii. 27. Fournier Bay, Anvers Island, Palmer Archipelago. Large fish trap, 36 m.: 1 specimen, 100 mm.

St. 190. 24. iii. 27. Bismarck Strait, Palmer Archipelago. Large dredge—large rectangular net, 93–130 m.: 1 specimen, 152 mm.

St. 371. 14. iii. 30. 1 mile E of Montagu Island, South Sandwich Islands. Large otter trawl, with nets (4 mm. and 7 mm. mesh) attached, 99–161 m.: 4 specimens, 130–165 mm.

Depth of body 4 to $4\frac{3}{4}$ in the length, length of head $3\frac{1}{3}$ to $3\frac{3}{4}$. Snout as long as or rather shorter than eye, diameter of which is 3 to 4 in length of head; interorbital width 14 to 18. Jaws equal anteriorly; maxillary extending to below anterior $\frac{1}{4}$ or $\frac{1}{3}$ of eye; cheeks and opercles more or less fully scaled, but lower part of cheek and edge of preoperculum naked; occiput, interorbital region, snout and praeorbital naked; 10 to 13 gill-rakers on lower part of anterior arch. Scales on body ctenoid; 55 to 62 in a longitudinal series from above base of pectoral to caudal; 35 to 42 in upper lateral line, which ends below posterior part of dorsal; lower lateral line without tubular

scales. Dorsal IV–VI, 36–40. Anal 34–36. Pectoral with 22 or 23 rays, $\frac{2}{3}$ to $\frac{4}{5}$ length of head, generally rather shorter than pelvics, which reach vent or anal. Caudal rounded or subtruncate; caudal peduncle much deeper than long. Body with 2 or 3 series of large, partly confluent, irregular blackish spots and blotches, sometimes forming more or less definite oblique cross-bars; cheek usually with two oblique dark stripes; a round black spot on spinous dorsal; soft dorsal, caudal and anal with or without series of small dark spots, which, when present, may form stripes or bars; pectorals and pelvics pale, sometimes with narrow darker cross-bars.

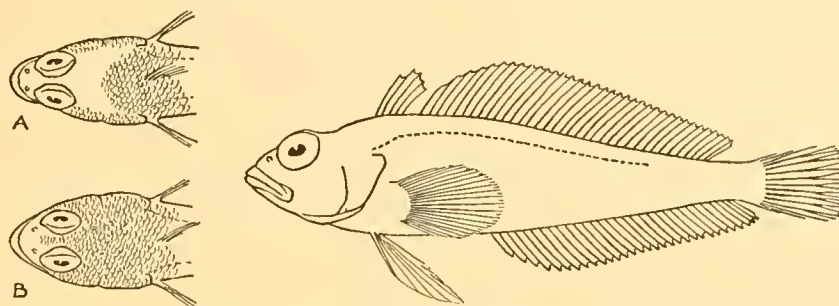


Fig. 9. *Notothenia nudifrons*. A, Dorsal view of head of *N. nudifrons*; B, The same of *N. mizops*. $\times \frac{1}{2}$.

Hab. Graham Land and neighbouring islands; South Shetlands; South Orkneys; South Sandwich Islands; South Georgia.

This species was originally described from 7 specimens from Cape Seymour and south of Snow Hill, Graham Land, and from numerous specimens from South Georgia, at depths ranging from 12 to 250 metres. It is very common at South Georgia, at all depths from 10 to 250 metres. In life the fish appears to be reddish or reddish-brown on the back and sides and silvery white below; the spots are dark brown.

In general appearance this species is very similar to *N. mizops*, from Kerguelen, but may be readily distinguished by the naked occiput and interorbital region, the somewhat more numerous dorsal and anal rays, and the smaller scales.

I have examined 3 specimens in the Paris Museum, 62 to 118 mm. in total length, from the South Shetlands.

Notothenia acuta, Günther.

Notothenia acuta, Günther, 1880, *Shore Fish. 'Challenger'*, p. 17; Pappenheim, 1912, *Deutsche Südpol.-Exped.*, xiii, Zool. v, p. 171, pl. ix, fig. 3; Regan, 1913, *t.c.*, p. 272, pl. viii, fig. 3; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, 1, p. 62.

Depth of body $5\frac{3}{4}$ to 6 in the length, length of head 3 to $3\frac{2}{3}$. Snout a little shorter than eye, diameter of which is 3 to $3\frac{3}{4}$ in length of head; interorbital width about 16. Jaws equal anteriorly; maxillary extending to below anterior part of eye; cheeks, opercles, occiput and interorbital region scaly; snout naked in young, but partially scaled in larger specimens; preorbital naked; 12 or 13 gill-rakers on lower part of anterior arch. Scales on body ctenoid; 54 to 60 in a longitudinal series from above base of pectoral to caudal; 36 to 39 in upper lateral line, which ends below posterior

part of dorsal or extends to base of caudal; 15 to 18 in lower lateral line. Dorsal VI-VII, 28-30. Anal 28-31. Pectoral with 19 or 20 rays, as long as or nearly as long as head, longer than pelvics, which reach the vent. Caudal rounded; caudal peduncle somewhat deeper than long. Body marbled with darker, and with 3 or 4 short, broad dark bars on upper parts of sides; dorsal rays sometimes with series of small spots; caudal fin faintly barred.

Hab. Kerguelen.

This description is based upon the type, about 62 mm. in total length, and upon 5 specimens, 48 to 95 mm. in total length, collected by the B.A.N.Z. Antarctic Research Expedition. The species occurs in fairly shallow water, the greatest depth at which it has been taken being 30 metres.

***Notothenia angustifrons*, Fischer.**

Notothenia angustifrons, Fischer, 1885, *Jahrb. Hamburg. Wiss. Anst.*, 11, p. 55; Regan, 1913, *t.c.*, p. 274, pl. viii, fig. 1.

Notothenia marionensis, Lönnberg, 1905, *Wiss. Ergebn. Schwed. Südpol.-Exped.*, v (6), p. 27; 1906, *K. Svensk. Vet.-Akad. Handl.* XL (5), p. 93.

St. MS 6. 14. ii. 25. East Cumberland Bay, South Georgia. Small beam trawl, 24-30 m.: 1 specimen, 64 mm.

St. MS 10. 14. ii. 25. East Cumberland Bay, South Georgia. Small beam trawl, 26-18 m.: 12 specimens, 62-125 mm.

St. MS 12. 17. ii. 25. East Cumberland Bay, South Georgia. Small beam trawl, 25-60 m.: 2 specimens, 70, 120 mm.

St. MS 25. 13. iv. 25. East Cumberland Bay, South Georgia. Small beam trawl, 36 m.: 1 specimen, 70 mm.

St. MS 32. 1. v. 25. East Cumberland Bay, South Georgia. Small beam trawl, 40 m.: 2 specimens, 88, 182 mm.

St. MS 33. 1. v. 25. 1 cable E of Hobart Rock, East Cumberland Bay, South Georgia. Small beam trawl, 40 m.: 1 specimen, 86 mm.

St. MS 62. 24. ii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 31 m.: 2 specimens, 73, 77 mm.

St. MS 63. 24. ii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 23 m.: 3 specimens, 68-100 mm.

St. MS 65. 28. ii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 20-12 m.: 2 specimens, 120, 150 mm.

St. MS 66. 28. ii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 18 m.: 3 specimens, 72-88 mm.

St. MS 67. 28. ii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 38 m.: 2 specimens, 65, 85 mm.

St. MS 71. 9. iii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 110-60 m.: 1 specimen, 60 mm.

St. MS 74. 17. iii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 22-40 m.: 8 specimens, 55-205 mm.

St. —. 2. iv. 26. King Edward's Cove, South Georgia. Hand line, 5 m.: 1 specimen, 68 mm., found in mouth of *Notothenia rossii*.

St. WS 25. 17. xii. 26. Undine Harbour (North), South Georgia. Small beam trawl, 18-27 m.: 15 specimens, 35-155 mm.

St. 141. 29. xii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 17–27 m.: 14 specimens, 57–115 mm.

St. 145. 7. i. 27. Stromness Harbour, South Georgia. Small beam trawl, 26–35 m.: 3 specimens, 103–180 mm.

St. WS 62. 19. i. 27. Wilson Harbour, South Georgia. Small beam trawl, 26–83 m.: 2 specimens, 50, 52 mm.

St. 370. 10. iii. 30. 2 miles NE of Bristol Island, South Sandwich Islands. Large otter trawl, 80–18 m.: 42 specimens, 75–148 mm.

St. —. 25. iii. 30. Grytviken, South Georgia. Hand line, 5.5 to 10 metres: 1 specimen, 72 mm., from stomach of *Notothenia rossii*.

Depth of body 5 to $5\frac{3}{5}$ in the length, length of head $3\frac{1}{4}$ to $3\frac{2}{3}$. Snout as long as or rather longer than eye, diameter of which is $3\frac{3}{4}$ to nearly 5 in length of head; inter-orbital width 15 to 20. Jaws about equal anteriorly; maxillary extending to below anterior margin or anterior $\frac{1}{4}$ of eye; upper surface of head scaly to between nostrils; cheeks and opercles in great part scaly, but naked below and at edge of praeoperculum; snout and praeorbital naked; 10 to 12 gill-rakers on lower part of anterior arch. Scales on body ctenoid; 46 to 52 in a longitudinal series from above base of pectoral to caudal; 26 to 34 in upper lateral line, which ends below middle or posterior part of dorsal; 15 to 26 in lower lateral line. Dorsal V–VIII, 28–30. Anal 29–31. Pectoral with 19 to 21 rays, $\frac{4}{5}$ to $\frac{5}{6}$ length of head, much longer than pelvics, which do not reach the vent in adult. Caudal rounded; caudal peduncle about as long as deep. Back with dark transverse bars, which break up into spots on the sides of the body; often a bar through the spinous dorsal, connecting the bases of the pectorals; dorsal, caudal and pectorals with series of small dark spots on the rays; anal and pelvics pale, sometimes with some darker spots; often a blackish spot on the upper part of the pectoral base.

Hab. South Sandwich Islands; South Georgia.

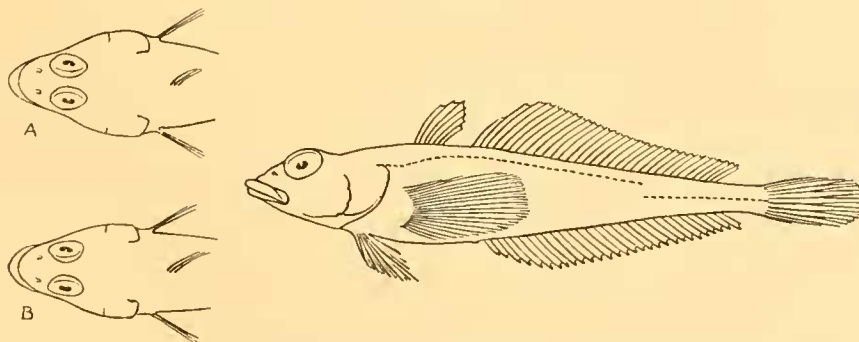


Fig. 10. *Notothenia angustifrons*. $\times \frac{2}{3}$. A, Dorsal view of head of *N. angustifrons*; B, The same of *N. marionensis*. $\times 1$.

This species, which is very common in shallow water round South Georgia, was originally described from 2 specimens, 82 and 88 mm. in length respectively, now preserved in the Zoological Museum at Hamburg (No. 3921). According to Lönnberg, this fish lives on the bottom among the algae, but is also often found "lying openly on the clayey bottom, inside the kelp". Unlike *N. gibberifrons*, it is said to be very active and difficult to catch.

Notothenia marionensis, Günther.

Notothenia marionensis, Günther, 1880, *Shore Fish. 'Challenger'*, p. 17; Regan, 1913, *t.c.*, p. 273, pl. viii, fig. 2.

Very closely related to *N. angustifrons*, but the interorbital width is 10 in the length of the head. Dorsal VII, 29. Anal 27. Pectoral $\frac{3}{4}$ length of head. Caudal peduncle a little deeper than long.

Hab. Marion Island, Kerguelen District.

This species is known only from the holotype, 82 mm. in total length, from 100 to 150 metres.

Notothenia cyanobrancha, Richardson.

Notothenia cyanobrancha, Richardson, 1844, *Zool. 'Erebus' and 'Terror' (Fish.)*, p. 7, pl. iv; Studer, 1879, *Arch. Naturg.*, XLV (1), p. 131; Pappenheim, 1912, *Deutsche Südpol.-Exped.*, XIII, Zool. v, p. 171; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, 1, p. 62.

Notothenia purpuriceps, Richardson, 1844, *t.c.*, p. 7, pl. ii, figs. 3, 4; Günther, 1860, *Cat. Fish.*, 11, p. 262; Gill, 1876, *Bull. U.S. Nat. Mus.*, 111, p. 41; Studer, 1879, *t.c.*, p. 131.

Notothenia cyaneobrancha, Günther, 1860, *t.c.*, p. 261; Regan, 1913, *t.c.*, p. 275.

Notothenia coriiceps, Pappenheim, 1912, *t.c.*, p. 170, pl. ix, fig. 2.

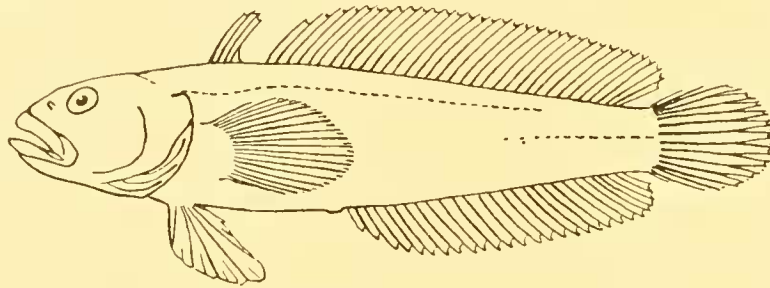


Fig. 11. *Notothenia cyanobrancha*. $\times \frac{4}{5}$.

Depth of body 4 to 5 in the length, length of head 3 to 4. Snout as long as or a little longer than eye, diameter of which is 4 to $6\frac{1}{2}$ in length of head; interorbital width 5 to $6\frac{1}{2}$. Jaws equal anteriorly; maxillary extending to below middle or posterior part of eye; upper surface of head naked except for a few temporal and post-temporal scales, which may be absent in the young; cheek scaly behind and below eye, the lower $\frac{1}{2}$ (young) or $\frac{1}{4}$ (adult) naked; upper part of operculum scaly; 10 to 13 gill-rakers on lower part of anterior arch. Scales on body ctenoid; 60 to 70 in a longitudinal series from above base of pectoral to caudal; 32 to 39 in upper lateral line which ends below posterior part of dorsal; lower lateral line, when developed, with 6 to 15 tubular scales. Dorsal IV–VI, 33–36. Anal 30–34. Pectoral with 20 or 21 rays, $\frac{3}{5}$ to $\frac{3}{4}$ length of head, as long as or longer than pelvics, which do not generally reach the vent in adult. Caudal rounded; caudal peduncle much deeper than long. More or less uniformly brownish or black, but sometimes with traces of darker markings; usually an oblique dark stripe from eye to angle of preoperculum, and another below this; all the fins more or less dusky or blackish, at least in adult.

Hab. Kerguelen.

In addition to a number of specimens in the British Museum collection, 120 to 260 mm. in total length, including the type of the species (260 mm.) and the type of *N. purpuriceps* (128 mm.), the above description is based upon a large series of examples, 37 to 280 mm. in total length, collected by the B.A.N.Z. Antarctic Research Expedition. This is a shallow water and littoral species, which is abundant under stones between the tide-marks.

***Notothenia coriiceps*, Richardson.**

Notothenia coriiceps, Richardson, 1844, *Zool. 'Erebus' and 'Terror'* (Fish.), p. 5, pl. iii, figs. 1, 2; Günther, 1860, *Cat. Fish.*, 11, p. 261; Günther, 1879, *Phil. Trans. R. Soc.*, CLXVIII (extra vol.), p. 166; Vaillant, 1906, *Bull. Mus. Paris*, 1906, No. 3, p. 139; 1906, *Expéd. Antarct. Franç.* (1903-1905), Poiss., p. 24; Roule and Despax, 1911, *Bull. Mus. Paris*, 1911, No. 5, p. 278; Roule, Angel and Despax, 1913, *Deux. Expéd. Antarct. Franç.* (1908-1910), Poiss., p. 3; Regan, 1913, *t.c.*, pp. 240, 276; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 22; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, 1, p. 63.

? *Pagothenia antarctica*, Nichols and LaMonte, 1936, *Amer. Mus. Novit.*, 839, p. 3, fig. 1.

St. —. 1922-23. Deception Island, South Shetlands, 10-30 m.: 1 specimen, 240 mm., collected by Mr A. G. Bennett.

St. 154. 18. i. 27. Jason Harbour to Larsen Point, South Georgia. Large otter trawl, 60-160 m.: 1 specimen, 530 mm.

St. —. 29. i. 27. Grytviken, South Georgia. Hand line, 3-4 m.: 1 specimen, 340 mm.

St. 163. 17. ii. 27. Paul Harbour, Signy Island, South Orkneys. Small beam trawl, 18-27 m.: 1 specimen, 420 mm.

St. 165. 18-19. ii. 27. Dove Strait, SE of Queen's Bay, Signy Island, South Orkneys. Large fish trap, 10 m.: 6 specimens, 330-370 mm.

St. 173. 28. ii. 27. Port Foster, Deception Island, South Shetlands. Small beam trawl, 5-60 m.: 1 specimen, 72 mm.

St. 174. 28. ii.-2. iii. 27. Deception Island, South Shetlands. Large fish trap, 5-10 m.: 5 specimens, 240-360 mm.

St. 179. 10. iii. 27. Melchior Island, Schollaert Channel, Palmer Archipelago. Small dredge, 4-10 m.: 1 specimen, 140 mm.

St. —. 13. iv. 27. Deception Island, South Shetlands. From trap on outer side of entrance: 2 specimens, 230, 235 mm.

St. 1092. 18. i. 33. Signy Island, South Shetlands. Found in bird's nest: 1 specimen, 72 mm.

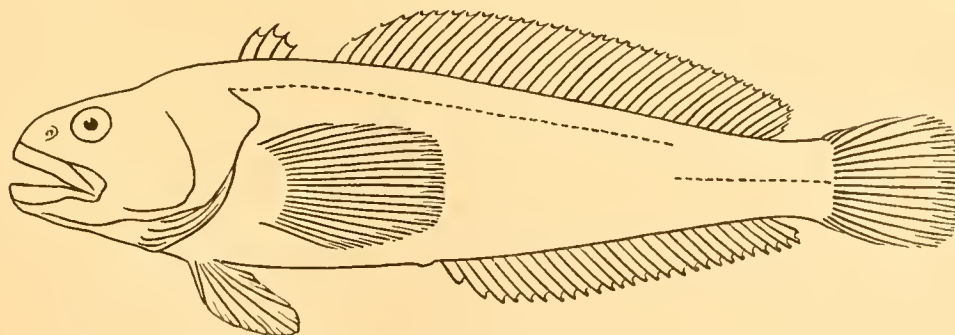


Fig. 12. *Notothenia coriiceps*. $\times \frac{1}{3}$.

Depth of body $3\frac{2}{3}$ to $4\frac{1}{2}$ in the length, length of head $2\frac{4}{5}$ to $3\frac{2}{3}$. Snout longer than eye, diameter of which is 4 (young) to 7 in length of head; interorbital width $3\frac{4}{5}$ to 5 ($3\frac{2}{3}$ in large specimens). Jaws equal anteriorly; maxillary extending to below anterior part or middle (young) or posterior margin (adult) of eye; head naked, except for a few scales behind eye, on upper part of operculum, and on post-temporal region; 10 to 14 gill-rakers on lower part of anterior arch. Scales on body cycloid; 54 to 68 in a longitudinal series from above base of pectoral to caudal; 34 to 49 in upper lateral line, which ends below posterior part of dorsal; 6 to 17 in lower lateral line. Dorsal III-VII, 35-40. Anal 27-31. Pectoral with 17 or 18 rays, from less than $\frac{2}{3}$ (large specimens) to $\frac{5}{6}$ length of head, longer than pelvics, which do not or scarcely reach the vent. Caudal subtruncate or a little rounded in adult and half-grown specimens, emarginate in young; caudal peduncle nearly as long as deep. Coloration varying from dark greenish-black to a pale orange-yellow, with or without spots and markings; usually one or two oblique dark bars across cheek, sometimes broken up into spots; head sometimes with pale spots enclosed in dark rings; spots on body and dorsal fin sometimes large and tessellated, more often small and scattered, never very distinct and rarely uniting to form longitudinal stripes; dorsal and anal usually with pale edges, and sometimes with dark submarginal bands; pectorals and caudal more or less dusky; pelvics paler. Young dark on back, silvery on sides and beneath; a large black blotch on extremity of pectoral fin.

Hab. Graham Land and neighbouring islands; South Shetlands; South Orkneys; South Georgia; Kerguelen; Crozets; Heard Island; Adelie Land; Victoria Land.

This is the only species of *Notothenia* occurring on the coasts of the Victoria Quadrant of the Antarctic Continent. The type of the species from Kerguelen measures 255 mm. in total length.

The silvery young, which are probably pelagic in habit, are very similar to those of the closely related *N. rossii*, but may be readily distinguished from them by the black blotch on each pectoral fin. *Pagothenia antarctica* is known only from the unique holotype, 68 mm. in length to base of caudal, from Echo Canyon, 16 miles south-west of Little America ($78^{\circ} 45' S$, $165^{\circ} 00' W$). Several of these fish were seen alive in a seal hole—an opening in a water filled crevasse, about 20 feet deep. Their colour in life was seen to be “an iridescent blue like the general color of the crevasse, some having patches of coral pink near the head”. It is possible that these were young examples of *N. coriiceps*, and it may be noted that in the young specimen obtained from a bird's nest in the South Shetlands by the Discovery Committee the tubules of the upper lateral line are somewhat indistinct.

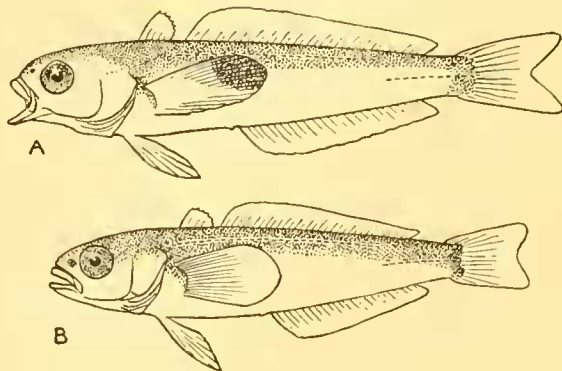


Fig. 13. Young of A, *Notothenia coriiceps*;
B, *N. rossii*. $\times 1$.

I have examined a poorly preserved specimen in the Paris Museum (No. 05—540), 198 mm. in length (without caudal). This bears a label "Orcades du Sud—Lahille".

Notothenia rossii, Richardson.

Notothenia rossii, Richardson, 1844, *Zool. 'Erebus' and 'Terror'* (Fish.), p. 9, pl. v, figs. 1, 2; Günther, 1860, *Cat. Fish.*, 11, p. 263; Regan, 1913, *t.c.*, pp. 240, 276; 1916, *Ann. Mag. Nat. Hist.*, (8) xviii, p. 378; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, 1, p. 64.

Macronotothen rossii, Gill, 1861, *Proc. Acad. Nat. Sci. Philad.*, 1861, p. 521.

Notothenia marmorata, Fischer, 1885, *Jahrb. Hamburg. Wiss. Anst.*, 11, p. 53.

Notothenia macrocephala subsp. *marmorata*, Lönnberg, 1905, *Wiss. Ergebn. Schwed. Südpol.-Exped.*, v (6), p. 34; 1906, *K. Svensk. Vet.-Akad. Handl.*, xl (5), p. 94.

Notothenia coriiceps var. *macquariensis*, Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 64, pl. v, fig. 3, text-fig. 16.

St. MS 6. 14. ii. 25. East Cumberland Bay, South Georgia. Small beam trawl, 30 m.: 2 specimens, 115, 133 mm.

St. MS 10. 14. ii. 25. East Cumberland Bay, South Georgia. Small beam trawl, 26–18 m.: 5 specimens, 65–68 mm.

St. MS 25. 13. iv. 25. East Cumberland Bay, South Georgia. Small beam trawl, 36 m.: 6 specimens, 65–70 mm.

St. MS 63. 24. ii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 23 m.: 1 specimen, 68 mm.

St. MS 71. 9. iii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 110–60 m.: 2 specimens, 60, 69 mm.

St. MS 74. 17. iii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 22–40 m.: 1 specimen, 68 mm.

St. —. 2. iv. 26. King Edward's Cove, South Georgia. Hand-line, 5 m.: 1 specimen, 330 mm.

St. 45. 6. iv. 26. 2.7 miles S 85° E of Jason Light, South Georgia. Large otter trawl, 270–238 m.: 1 specimen, 420 mm.

St. —. 6. i. 27. Stromness Harbour, South Georgia. Hand-line, 9–10 m.: 2 specimens, 295, 355 mm.

St. 145. 7. i. 27. Stromness Harbour, South Georgia. Small beam trawl, 26–35 m.: 3 specimens, 103–250 mm.

St. —. 11. i. 27. Prince Olaf Harbour, South Georgia. Hand-line, 5 m.: 2 specimens, 195, 320 mm.

St. WS 65. 22. i. 27. Undine Harbour (North), South Georgia. Hand-line, 5 m.: 1 specimen, 290 mm.

St. 174. 28. ii.–2. iii. 27. Deception Island, South Shetlands. Large fish trap, 5–10 m.: 1 specimen, 245 mm.

St. WS 111. 25. v. 27. 53° 39' 00" S, 35° 34' 00" W. 70 cm. tow-net, horizontal, 0–5 m.: 1 specimen, 65 mm.

St. —. 27. iii. 28. South Georgia. 1 specimen, 56 mm., picked up on whaling plan.

St. —. 1–4. iv. 29. Government Jetty, Grytviken, South Georgia. 0–2 m.: 8 specimens, 62–70 mm.

St. WS 426. 15. iv. 29. 53° 34' 00" S, 40° 10' 00" W. Washed on board through scupper: 1 specimen, 60 mm.

St. —. 25. iii. 30. Grytviken, South Georgia. Hand-line, 6–10 m.: 22 specimens, 60–80 mm., taken from stomach of *Notothenia rossii*.

St. —. 30. iii. 30. Stromness Harbour, South Georgia. Hand-net, surface: 8 specimens, 65–73 mm.

St. WS 534. 22-23. i. 31. $54^{\circ} 17\frac{1}{2}'$ S, $35^{\circ} 39'$ W. Hand-line (?), 5 m. (?): 1 specimen, 695 mm.
 St. —. 28. iii. 31. Jetty, South Georgia. Hand-line: 4 specimens, 142-168 mm.

In addition to the above, the following specimens were obtained by S.S. 'Sitka':

7. i. 27. 30 miles NE of Cape Saunders, South Georgia. Hand-line, 1-2 m.: 2 specimens, 540, 590 mm., caught in a patch of "krill".

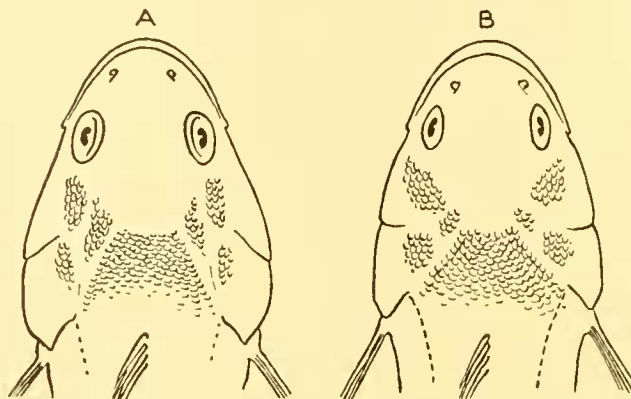


Fig. 14. Dorsal view of head of A, *Notothenia coriiceps*; B, *N. rossii*. $\times \frac{1}{2}$.

Depth of body $3\frac{1}{2}$ to $4\frac{2}{3}$ in the length, length of head $3\frac{1}{4}$ to $3\frac{3}{4}$. Snout longer than eye (except in young), diameter of which is $3\frac{2}{3}$ (young) to $6\frac{1}{2}$ in length of head; interorbital width $2\frac{3}{4}$ (large specimens) to about $3\frac{3}{4}$. Jaws equal anteriorly or lower a little projecting; maxillary extending to below anterior part or middle of pupil, sometimes a little beyond; scales on upper part of cheek and operculum and on temporal region; upper surface of head papillose; 11 to 13 gill-rakers on lower part of anterior arch. Scales on body cycloid; 55 to 62 in a longitudinal series from above base of pectoral to caudal; 45 to 52 in upper lateral line, which ends below posterior part of dorsal; 10 to 18 in lower lateral line. Dorsal IV-VII, 32-36. Anal 26-30. Pectoral with 21 to 23 rays, $\frac{2}{3}$ to $\frac{7}{8}$ length of head, extending to level of vent or beyond (not as far in large specimens); pelvics much shorter. Caudal subtruncate or a little rounded in adult and half-grown specimens, emarginate in young; caudal peduncle as long as deep or a little deeper than long. In young the back is dark, the greater part of the sides and the lower parts silvery; the body generally becomes more or less marbled with age, the markings sometimes tending to form irregular longitudinal stripes; head in adult and half-grown specimens often with dark spots; dorsal fins with 2 or 3 series of dark spots, usually united to form irregular vermiculations or longitudinal bands; anal usually with a broad dusky band, and with a pale edge; other fins varying from pale yellow to more or less dusky, the caudal sometimes with a dark band.

Hab. South Shetlands; South Orkneys; South Georgia; Kerguelen; Macquarie Island.

The type of the species was a large stuffed specimen, 850 mm. in total length. The actual locality is unknown, but, as suggested by Regan, it was quite likely taken at Kerguelen. Richardson describes the first dorsal fin as "comparatively low...supported by bluntish spines, destitute of flexibility, or of filamentous tips". Such a

spinous dorsal is often found in large Nototheniids, and has no taxonomic significance.

The silvery young of this species are said to have the back "lustrous blue" in life, and the fins quite transparent. They are found in shallow water, and are frequently taken at or near the surface. The adults and half-grown individuals present some variation in coloration, this being apparently dependent to some extent upon the depth of water in which they are living. According to Lönnberg, "the large specimens caught in the open sea, lived near the surface so that they easily could be seen swimming hither and thither". One large specimen was captured by the 'Discovery', however, at a depth of from 238 to 270 metres.

Notothenia macrocephala, Günther.

For a full synonymy and description of this species see Norman, 1937, *Discovery Rep.*, xvi, p. 88, fig. 43.

Hab. Patagonia; Falkland Islands; Straits of Magellan; coast of Chile; Kerguelen; New Zealand; Auckland Island; Campbell Island; Macquarie Island.

Peters (1876, *Monatsber. Akad. Berlin*, p. 837) described this species from Kerguelen as *Notothenia antarctica*, and there are two very small specimens from the same locality taken by the 'Challenger', which have been referred to this species by Regan (see Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 69, footnote). I have given a full description and figure in my previous report.

Notothenia colbecki, Boulenger.

Notothenia colbecki, Boulenger, 1902, *Rep. Coll. Nat. Hist. 'Southern Cross'*, p. 185, pl. xvi; Waite, 1909, *Subantarctic Isl. N. Zealand*, Pisces, p. 594; Regan, 1913, *t.c.*, p. 278; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 70.

Hab. Auckland Island; Campbell Island; Macquarie Island.

The types of this species, up to 385 mm. in total length, are from Campbell Island. Waite has recorded a single large individual, 685 mm in total length, caught with the hook amongst the kelp at Macquarie Island.

Genus TREMATOMUS

Trematomus, Boulenger, 1902, *Rep. Coll. Nat. Hist. 'Southern Cross'*, p. 177; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 258. Type *Trematomus newnesi*, Boulenger.

Differs from *Notothenia* only in that the hypercoracoid encloses its foramen. Vertebrae 52 to 56 (17-21+32-35).

Coasts of the Antarctic Continent; South Shetlands; South Orkneys; South Georgia.

Key to the Species

I. Upper surface of head naked.

A. Cheeks and opercles fully scaled.

- | | |
|---|---------------------|
| 1. Interorbital width $3\frac{1}{3}$ to 5 in head; dorsal V-VIII, 32-38; anal 32-36 | 1. <i>newnesi</i> . |
| 2. Interorbital width 8 or 9 in head; dorsal IV, 37; anal 32-35 | 2. <i>nicolai</i> . |

B. Cheeks and opercles scaly above, naked below.

1. Dorsal V-VI, 34-37; anal 31-33 ... 3. *borchgrevinkii*.
2. Dorsal IV-V, 30-33; anal 29-30 ... 4. *brachysoma*.

II. Occiput scaly; cheeks and opercles fully scaled.

A. Interorbital region naked or incompletely scaled.

1. Eye 3 to $4\frac{1}{2}$ in head, which is $3\frac{1}{4}$ to 4 in length (without caudal); interorbital region naked or with a median series of scales; 60 to 75 scales in a longitudinal series ... 5. *bernacchii*.
2. Eye ($3\frac{2}{3}$ young) $4\frac{2}{5}$ to $4\frac{3}{6}$ in head, which is $3\frac{1}{4}$ to $3\frac{1}{3}$ in length (without caudal); interorbital region with 2 or 3 series of scales in the middle (naked in young); 55 to 59 scales in a longitudinal series ... 6. *vicarius*.

B. Interorbital region fully scaled.

1. Snout and lower jaw naked; praeorbital naked (except in *T. scotti*).
 - a. Upper lateral line with at least 30 tubular scales, extending well beyond extremity of pectoral; praeorbital naked.
 - α . 60 to 75 scales in a longitudinal series; 36 to 46 in upper lateral line; pectoral with 27 to 29 rays.
 - * Dorsal V-VII, 36-41; anal 33-36 ... 7. *hansoni*.
 - ** Dorsal V-VI, 31-33; anal 31-33 ... 8. *loennbergii*.
 - β . 52 to 56 scales in a longitudinal series; 30 to 39 in upper lateral line; pectoral with 24 or 25 rays; dorsal IV-VI, 32-36.
 - * Dorsal spines flexible; eye $3\frac{1}{4}$ to $3\frac{1}{2}$ in head ... 9. *pennellii*.
 - ** Dorsal spines pungent; eye $2\frac{3}{4}$ to $3\frac{1}{4}$ in head ... 10. *centronotus*.
 - b. Upper lateral line with 10 to 23 tubular scales, rarely extending beyond extremity of pectoral fin; praeorbital usually partly or entirely scaled ... 11. *scotti*.
2. Snout, lower jaw, and praeorbital scaled.
 - a. Vent much nearer to tip of snout than to end of anal fin; 26 to 38 tubular scales in lower lateral line; dorsal VI-VII, 31-33; anal 34-36 ... 12. *lepidorhinus*.
 - b. Vent nearly equidistant from tip of snout and end of anal fin; 10 to 22 tubular scales in lower lateral line; dorsal VI-VII, 34-37; anal 32-34 ... 13. *eulepidotus*.

Trematomus newnesi, Boulenger.

Trematomus newnesi, Boulenger, 1902, *Rep. Coll. Nat. Hist.* 'Southern Cross', p. 177, pl. xi; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, pp. 239, 259; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 18; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, 1, p. 69.

Notothenia cyaneobrancha, Vaillant, 1906, *Bull. Mus. Paris*, 1906, No. 3, p. 139; 1906, *Expéd. Antarct. Franç.* (1903-1905), Poiss., p. 26.

Notothenia microlepidota, Vaillant, 1906, *t.c.*, p. 139; 1906, *t.c.*, p. 35.

Notothenia hodgsoni, Boulenger, 1907, *Nat. Antarct. Exped. Nat. Hist.*, II, Fish., p. 2, pl. i, fig. 2.

St. —. 8. ii. 24. Deception Island, South Shetlands. 3 specimens, 98-110 mm., from stomach of Shag; collected by Mr J. E. Hamilton.

St. 163. 17. ii. 27. Paul Harbour, Signy Island, South Orkneys. Small beam trawl, 18-27 m.: 1 specimen, 75 mm.

St. 173. 28. ii. 27. Port Foster, Deception Island, South Shetlands. Small beam trawl, 5-60 m.: 7 specimens, 66-80 mm.

St. 179. 10. iii. 27. Melchior Island, Schollaert Channel, Palmer Archipelago. Small dredge, 4-10 m.: 5 specimens, 30-70 mm.

St. 184. 15-16. iii. 27. Fournier Bay, Anvers Island, Palmer Archipelago. Large fish trap, 36 m.: 1 specimen, 87 mm.

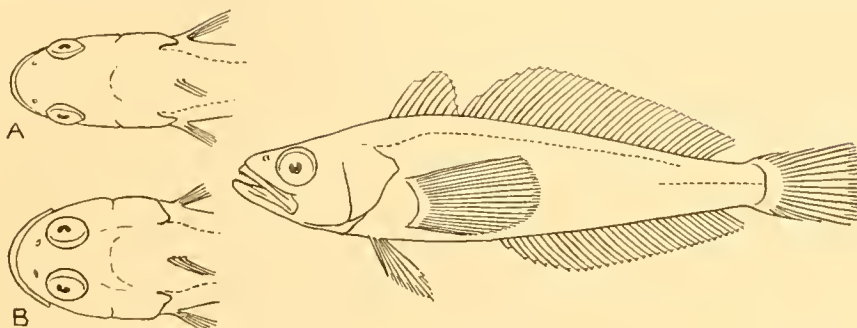


Fig. 15: *Trematomus newnesi*. A, Dorsal view of head of *T. newnesi*; B, The same of *T. nicolai*. $\times \frac{1}{2}$.

Depth of body 4 to $5\frac{1}{2}$ in the length, length of head $3\frac{1}{4}$ to $4\frac{1}{4}$. Snout rather shorter than eye, diameter of which is 3 to $4\frac{1}{3}$ in length of head; interorbital width $3\frac{1}{3}$ to 5. Jaws equal anteriorly or lower a little projecting; maxillary extending to below anterior part or middle of eye (young) or beyond (adult); upper surface of head naked, cheeks and opercles scaly; 15 to 20 gill-rakers on lower part of anterior arch. Scales on body rather feebly ctenoid; 68 to 86 in a longitudinal series from above base of pectoral to caudal; 40 to 52 in upper lateral line, which ends below posterior rays of dorsal; 3 to 19 in lower lateral line. Dorsal V-VIII, 32-38. Anal 32-36. Pectoral with 24 or 25 rays, $\frac{3}{4}$ length of head or more, longer than pelvics, which reach the vent in young but not in adult. Caudal truncate (adult) or a little emarginate (young); caudal peduncle about as long as deep. Brownish, usually spotted or marbled, or with irregular cross-bars; spinous dorsal blackish; other fins dusky, often with small dark spots.

Hab. Graham Land; South Shetlands; South Orkneys; Mac-Robertson Land; Queen Mary Land; Adelie Land; South Victoria Land.

The numerous types of this species, ranging in length from 90 to 190 mm., are from Duke of York Island, near Cape Adare, 6 to 10 metres, and from Cape Adare, 8 to 16 metres; those of *N. hodgsoni*, measuring up to 160 mm. in total length, are from the 'Discovery' Winter Quarters, Ross Island. This species seems to occur mainly in shallow water.

I have examined 7 specimens in the Paris Museum (No. 06-119), 70 to 120 mm. in total length, identified by Vaillant as *Notothenia cyaneobranchia*. Specimens identified by the same author as *N. microlepidota* cannot now be found. The British Graham Land Expedition, 1934-7, obtained 4 specimens (60 to 92 mm.), from approximately 65° S, 65° W, at a depth of about 12 metres.

Trematomus nicolai (Boulenger).

Notothenia nicolai, Boulenger, 1902, *Rep. Coll. Nat. Hist. 'Southern Cross'*, p. 184, pl. xv.

Trematomus nicolai, Regan, 1913, *t.c.*, p. 260; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, 111 (1), Fishes, p. 18.

Depth of body nearly 4 in the length, length of head $3\frac{1}{3}$ to $3\frac{1}{2}$. Snout shorter than eye, diameter of which is $2\frac{4}{5}$ (young) to $3\frac{1}{3}$ in length of head; interorbital width 8 to 9. Lower jaw a little projecting; maxillary extending to below anterior $\frac{1}{4}$ or $\frac{1}{3}$ of eye; upper surface of head naked; cheeks and opercles scaly; 11 or 12 gill-rakers on lower part of anterior arch. Scales on body ctenoid; 58 to 62 in a longitudinal series from above base of pectoral to caudal; 39 to 43 in upper lateral line, which ends below posterior rays of dorsal, 8 to 18 in lower lateral line. Dorsal IV-V, 37. Anal 32-35. Pectoral with 28 to 30 rays, $\frac{3}{4}$ to $\frac{4}{5}$ length of head, somewhat longer than pelvics, which reach vent or origin of anal. Caudal rounded; caudal peduncle nearly as long as deep. Brownish, with indistinct dark cross-bars, and sometimes with some scattered small dark spots; fins dusky.

Hab. Queen Mary Land; South Victoria Land.

The types of the species, 3 specimens 150 to 250 mm. in total length, are from Cape Adare, 10 to 16 metres, and from Duke of York Island, near Cape Adare, 8 metres. The two examples recorded by Waite from Queen Mary Land, each 115 mm. in total length, were from a depth of 643 metres.

***Trematomus borchgrevinki*, Boulenger.**

Trematomus borchgrevinki, Boulenger, 1902, *Rep. Coll. Nat. Hist.* 'Southern Cross', p. 179, pl. xii; 1907, *Nat. Antarct. Exped. Nat. Hist.*, 11, Fish., p. 1; Pappenheim, 1912, *Deutsche Südpol.-Exped.*, XIII, Zool. v, p. 171; Roule, Angel and Despax, 1913, *Deux. Expéd. Antarct. Franç.* (1908-1910), Poiss., p. 6; Regan, 1913, *t.c.*, pp. 239, 260.

Trematomus borchgrevinski, Roule and Despax, 1911, *Bull. Mus. Paris*, 1911, No. 5, p. 279.

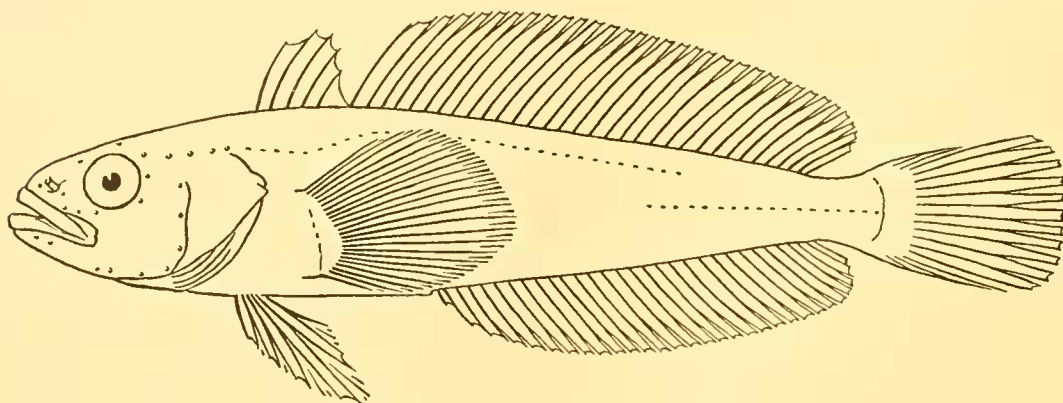


Fig. 16. *Trematomus borchgrevinki*. $\times \frac{1}{2}$.

Depth of body 4 to 5 in the length, length of head $3\frac{1}{2}$ to $4\frac{1}{4}$. Snout as long as or a little longer than eye, diameter of which is 4 to 5 in length of head; interorbital width 3 to 4. Jaws equal anteriorly or lower a little projecting; maxillary extending to below anterior $\frac{1}{3}$ of eye; upper surface of head naked; upper parts of cheeks and opercles scaly; 16 to 19 gill-rakers on lower part of anterior arch. Scales on body ctenoid; 78 to 96 in a longitudinal series from above base of pectoral to caudal; lateral lines without or with only a few tubular scales. Dorsal V-VI, 34-37. Anal 31-33. Pectoral with

23 rays, $\frac{3}{4}$ to $\frac{7}{8}$ length of head, longer than pelvics, which rarely reach the vent. Caudal rounded or subtruncate; caudal peduncle as long as deep or deeper than long. Yellowish, with dark spots or irregular cross-bars; dorsal and caudal sometimes with series of spots.

Hab. Graham Land; South Orkneys; Wilhelm Land; South Victoria Land.

The types of the species, 120 to 275 mm. in total length, are from Cape Adare and from Duke of York Island, near Cape Adare. The species is known only from shallow water.

The British Graham Land Expedition obtained 2 specimens (108 and 130 mm.) at the surface, and 7 specimens (c. 80 to 135 mm.) from stomachs of *Pygoscelis*, from approximately 65° S, 65° W.

***Trematomus brachysoma*, Pappenheim.**

Trematomus brachysoma, Pappenheim, 1912, *Deutsche Südpol.-Exped.*, xiii, Zool. v, p. 172; Regan, 1913, *t.c.*, p. 261; Regan, 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.* 1910, Zool. 1 (1), pp. 2, 3, pl. ii, fig. 3.

Depth of body $4\frac{1}{10}$ to $4\frac{7}{8}$ in the length, length of head 3 to $3\frac{2}{5}$. Snout about as long as eye, diameter of which is $3\frac{2}{5}$ to a little more than 4 in length of head; interorbital width 4 to $5\frac{1}{2}$. Jaws equal anteriorly; maxillary extending to below anterior part or middle of eye; upper surface of head naked; upper parts of cheeks and opercles scaly; 15 to 19 gill-rakers on lower part of anterior arch. Scales on body cycloid or feebly ctenoid; 55 to 60 in a longitudinal series from above base of pectoral to base of caudal; lateral lines without or with only a few tubular scales. Dorsal IV-V, 30-33. Anal 26-30. Pectoral with 23 or 24 rays, about $\frac{7}{8}$ length of head, much longer than pelvics, which reach the vent or not quite as far. Caudal rounded; caudal peduncle a little deeper than long. Yellowish brown, with a series of 6 dark spots on back below the dorsal fins, and 5 below them at level of base of pectoral; a round black spot on spinous dorsal; soft dorsal, caudal and sometimes the anal with series of small round dark spots forming irregular bars.

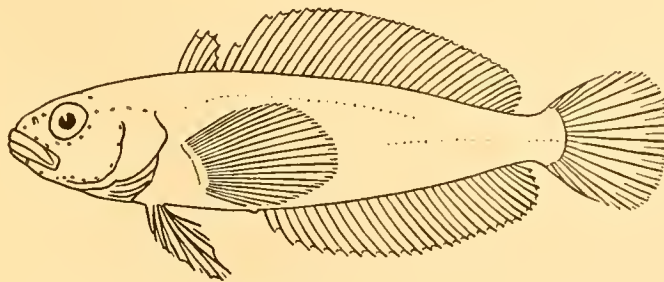


Fig. 17. *Trematomus brachysoma*. $\times \frac{1}{2}$.

Hab. Wilhelm Land; South Victoria Land.

The above description is based upon a co-type of the species, 126 mm. in total length, taken at the surface at the Winter Quarters of the 'Gauss'; and another example,

170 mm. in total length, stranded on an ice floe in $67^{\circ} 24' S$, $177^{\circ} 34' W$, taken by the 'Terra Nova'.

This species is closely related to *T. borchgrevinki*, but may be readily distinguished by the larger scales and the lower number of dorsal and anal rays.

Trematomus bernacchii, Boulenger.

Trematomus bernacchii, Boulenger, 1902, *Rep. Coll. Nat. Hist. 'Southern Cross'*, p. 181, pl. xiv; 1907, *Nat. Antarct. Exped. Nat. Hist.*, II, Fish., p. 1; Waite, 1911, *Brit. Antarct. Exped.*, 1907-1909, II, Biol., II, p. 12; Roule and Despax, 1911, *Bull. Mus. Paris*, 1911, No. 5, p. 279; Roule, Angel and Despax, 1913, *Deux. Expéd. Antarct. Franç.* (1908-1910), Poiss., p. 7; Regan, 1913, *t.c.*, pp. 239, 262, fig. 6 A; Regan, 1914, *t.c.*, p. 3, pl. i, fig. 1; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 19.

Notothenia marionensis, Vaillant, 1906, *Bull. Mus. Paris*, 1906, No. 3, p. 139.

Notothenia elegans, Vaillant, 1906, *Expéd. Antarct. Franç.* (1903-1905), Poiss., p. 28.

Notothenia longipes (part), Boulenger, 1907, *t.c.*, p. 1.

Notothenia nicolai, Boulenger, 1907, *t.c.*, p. 2.

Notothenia nicolai, Roule and Despax, 1911, *t.c.*, p. 278; Roule, Angel and Despax, 1913, *t.c.*, p. 5.

St. 178. 9-10. iii. 27. Melchior Harbour, Schollaert Channel, Palmer Archipelago. Large fish trap, 17 m.: 1 specimen, 137 mm.

St. 189. 23-24. iii. 27. Port Lockroy, Wiencke Island, Palmer Archipelago. Large fish trap, 70 m.: 1 specimen, 147 mm.

Depth of body 3 to $4\frac{1}{2}$ in the length, length of head $3\frac{1}{4}$ to 4. Snout as long as or rather shorter than eye, diameter of which is 3 to $4\frac{1}{2}$ in length of head; interorbital width 5 to 9. Jaws equal anteriorly or lower a little projecting; maxillary extending to below anterior part or middle of eye; cheeks, opercles and occiput scaly; interorbital region naked or with a median series of scales; 13 to 15 gill-rakers on lower part of anterior arch. Scales on body ctenoid; 60 to 75 in a longitudinal series from above base of pectoral fin to caudal; 30 to 42 in upper lateral line; lower lateral line usually without tubular scales. Dorsal IV-VI, 34-38. Anal 31-35. Pectoral with 23 to 25 rays, about $\frac{2}{3}$ length of head, about as long as pelvics, which just reach anal in young but not in adult. Caudal rounded; caudal peduncle deeper than long. Brownish; large dark spots in 2 or 3 alternating series; upper part of spinous dorsal blackish; other fins often more or less dusky.

Hab. Graham Land; South Shetlands; South Orkneys; Mac-Robertson Land; Queen Mary Land; Adelie Land; South Victoria Land.

The types of the species, 120 to 250 mm. in total length, are from Cape Adare, 10 to 16 metres, and from Duke of York Island, near Cape Adare, 6 to 8 metres. Like the previous species, *T. bernacchii* usually occurs in rather shallow water, but the 'Aurora' obtained one example from Commonwealth Bay at a depth of 635 to 732 metres.

Three young specimens (45-47 mm.), from Deception Island, South Shetlands, collected by Mr A. G. Bennett in February 1918, appear to be referable to this species. I have examined the specimen in the Paris Museum (No. 06-126), 118 mm. in total length, identified by Vaillant as *Notothenia elegans*. The fish (No. ?) from Peterman

Island, at a depth of 1 metre, identified by Roule, Angel and Despax as *N. nicolai*, is 135 mm. in total length, and is in very poor condition. Scales are apparently present on the occiput, but not on the interorbital region, and I have little doubt that the specimen should be referred to this species. The British Graham Land Expedition obtained 9 specimens (133 to 230 mm.) from fish traps at approximately 65° S, 65° W, and one specimen (95 mm.) thrown ashore at Barry Island (68° S, 67° W).

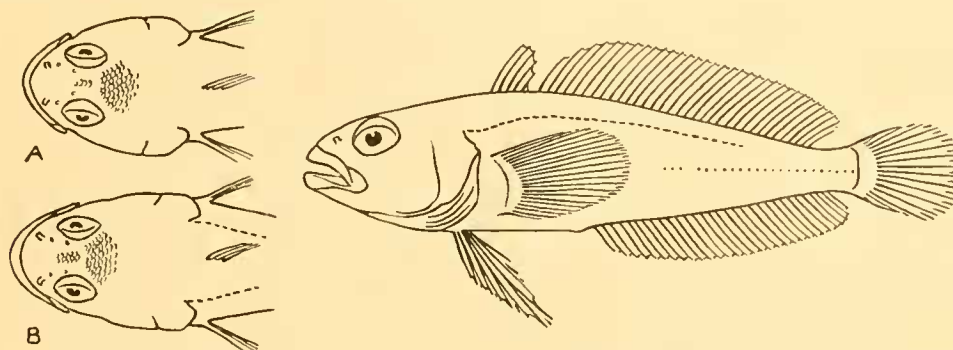


Fig. 18. *Trematomus bernacchii*. A, Dorsal view of head of *T. bernacchii*; B, The same of *T. vicarius*. $\times \frac{1}{2}$.

Trematomus vicarius, Lönnberg.

Trematomus bernacchii subsp. *vicarius*, Lönnberg, 1905, *Wiss. Ergebn. Schwed. Südpol.-Exped.*, v (6), p. 26.

? *Notothenia dubia*, Lönnberg, 1905, *t.c.*, p. 28, pl. iii, fig. 9.

Trematomus vicarius, Regan, 1913, *t.c.*, p. 261, fig. 6 B.

Trematomus dubius, Regan, 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.*, 1910, Zool. 1 (1), p. 2.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia. Large otter trawl, 179–235 m.: 1 specimen, 180 mm.

Very similar to the preceding species, but length of head $3\frac{1}{4}$ to $3\frac{1}{3}$ in that of fish (without caudal); diameter of eye ($3\frac{2}{3}$ young) $4\frac{2}{5}$ to $4\frac{3}{5}$ in length of head; interorbital width about 5 ($6\frac{1}{2}$ in young); interorbital region naked in young, but with 2 or 3 series of scales in the middle in adult and half-grown specimens. 55 to 59 scales in a longitudinal series, (30) 34 to 37 in upper lateral line. Dorsal V, 33–38. Anal 31–32. Pectoral $\frac{3}{4}$ to $\frac{4}{5}$ length of head, about as long as pelvics, which just reach the anal.

Hab. South Georgia.

The type of *T. vicarius*, 240 mm. in length without the caudal fin, was taken outside Boiler Harbour, Cumberland Bay, South Georgia, at a depth of 30 metres. This species is very close to *T. bernacchii*, and may eventually prove to be no more than a local race.

Notothenia dubia was based upon 3 specimens, 39 to 45 mm. in length without the caudal fin, from the same locality, at a depth of 20 metres; one of these types was examined by Regan. There can, I think, be little doubt that this form is the young of *T. vicarius*. Regan has compared the example of 50 mm. with one of *T. bernacchii* of the same size, and finds that it has a smaller eye, broader interorbital region, and larger scales—exactly the characters used to separate *T. bernacchii* from *T. vicarius*.

The British Graham Land Expedition obtained one specimen (69 mm.) from Stromness Bay, South Georgia, where it was found to be food of the Tern.

Trematomus hansonii, Boulenger.

Trematomus hansonii, Boulenger, 1902, *Rep. Coll. Nat. Hist. 'Southern Cross'*, p. 180, pl. xiii; Roule and Despax, 1911, *Bull. Mus. Paris*, 1911, No. 5, p. 279; Waite, 1911, *Brit. Antarct. Exped.*, 1907-1909, 11, Biol., 11, p. 13; Roule, Angel and Despax, 1913, *Deux. Expéd. Antarct. Franç.* (1908-1910), Poiss., p. 6; Regan, 1913, *t.c.*, pp. 239, 262; 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.*, 1910, Zool. 1 (1), p. 3, pl. i, fig. 2.

Trematomus hansonii subsp. *georgianus*, Lönnberg, 1905, *Wiss. Ergebn. Schwed. Südpol.-Exped.*, v (6), p. 25, pl. v, fig. 17.

Notothenia sima, Vaillant, 1906, *Bull. Mus. Paris*, 1906, No. 3, p. 139; 1906, *Expéd. Antarct. Franç.* (1903-1905), Poiss., p. 23.

Notothenia lepidorhinus (part), Pappenheim, 1912, *Deutsche Südpol.-Exped.* xiii, Zool. v, p. 169.

St. MS 68. 2. iii. 26. East Cumberland Bay, South Georgia. Large rectangular net, 220-247 m.: 4 specimens, 190-285 mm.

St. 30. 16. iii. 26. West Cumberland Bay, South Georgia. Large dredge, 251 m.: 1 specimen, 170 mm.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia. Large otter trawl, 179-235 m.: 22 specimens, 140-320 mm.

St. 45. 6. iv. 26. 2.7 miles S 85° E of Jason Light, South Georgia. Large otter trawl, 238-270 m.: 2 specimens, 180, 205 mm.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 230-250 m.: 2 specimens, 240, 295 mm.

St. WS 32. 21. xii. 26. Mouth of Drygalski Fjord, South Georgia. Small beam trawl, 91-225 m.: 1 specimen, 172 mm.

St. 148. 9. i. 27. Off Cape Saunders, South Georgia. Large otter trawl, 132-148 m.: 1 specimen, 250 mm.

St. WS 62. 19. i. 27. Wilson Harbour, South Georgia. Small beam trawl, 26-83 m.: 1 specimen, 79 mm.

St. 160. 7. ii. 27. Near Shag Rocks, South Georgia. Large dredge, 177 m.: 1 specimen, 138 mm.

St. 167. 20. ii. 27. Off Signy Island, South Orkneys. Net (7 mm. mesh) attached to back of trawl, 244-344 m.: 2 specimens, 142, 150 mm.

St. 178. 9-10. iii. 27. Melchior Harbour, Schollaert Channel, Palmer Archipelago. Large fish trap, 17 m.: 1 specimen, 135 mm.

The following young specimens may also belong here:

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 120-204 m.: 9 specimens, 41-44 mm.

St. 45. 6. iv. 26. 2.7 miles S 85° E of Jason Light, South Georgia. Large otter trawl, 238-270 m.: 6 specimens, 40-43 mm.

Depth of body $3\frac{1}{2}$ to $4\frac{2}{3}$ in the length, length of head $3\frac{1}{5}$ to 4. Snout as long as or a little longer than eye, diameter of which is $3\frac{2}{3}$ to 5 in length of head; interorbital width 5 to $6\frac{1}{5}$. Jaws about equal anteriorly; maxillary extending to below anterior part or middle of eye; occiput, interorbital region, cheeks and opercles scaly; 13 to 16 gill-rakers on lower part of anterior arch. Scales on body cycloid or ctenoid; 60 to 68 in a longitudinal series from above base of pectoral to caudal; 38 to 46 in upper lateral line; lower lateral line usually without tubular scales. Dorsal V-VII, 36-41. Anal

33–36. Pectoral with 27 to 29 rays, $\frac{3}{4}$ to $\frac{7}{8}$ length of head, longer than pelvics, which just reach the vent in young but not in adult. Caudal subtruncate; caudal peduncle about as long as deep. Brownish, with large dark spots or cross-bars; head often spotted; spinous dorsal blackish; other fins usually barred with series of dark spots.

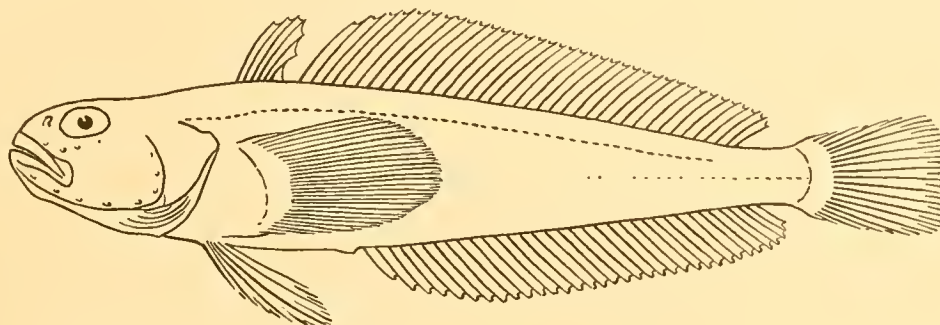


Fig. 19. *Trematomus hansonii*. $\times \frac{1}{2}$.

Hab. Graham Land and neighbouring islands; South Shetlands; South Orkneys; South Georgia; Coats Land; Wilhelm Land; Queen Mary Land; South Victoria Land.

The types of the species, 160 to 280 mm. in total length, are from Cape Adare, 8 to 16 metres, and from Duke of York Island, near Cape Adare, 6 to 8 metres. Regan has shown that Lönnberg's supposed subspecies from South Georgia is fully identical with the typical form. The specimen of 137 mm. from Booth Wandell Island (Paris Museum, No. 06—99), recorded by Vaillant as *Notothenia sima*, appears to belong here.

Trematomus loennbergii, Regan.

Notothenia nicolai (non Boulenger), Lönnberg, 1905, *Wiss. Ergebn. Schwed. Südpol.-Exped.*, v (6), p. 45.

Notothenia longipes (part), Boulenger, 1907, *Nat. Antarct. Exped. Nat. Hist.*, 11, Fish., p. 1.

Trematomus loennbergii, Regan, 1913, *t.c.*, p. 263, pl. viii, fig. 4; 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.*, 1910, Zool. 1 (1), p. 3; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, 111 (1), Fishes, p. 20.

Depth of body 4 to 5 in the length, length of head 3 to $3\frac{3}{4}$. Snout rather shorter than eye, diameter of which is 3 to $3\frac{1}{2}$ in length of head; interorbital width 6 to 10. Jaws about equal anteriorly; maxillary extending to below anterior $\frac{1}{4}$ or $\frac{1}{3}$ of eye; upper surface of head to nostrils, cheeks and opercles scaly; 10 to 13 gill-rakers on lower part of anterior arch. Scales on body more or less ctenoid; 60 to 75 in a longitudinal series from above base of pectoral to caudal; 34 to 46 in upper lateral line; lower lateral line, when developed, with 10 to 15 tubular scales. Dorsal V–VII, 31–35. Anal 31–35. Pectoral with 28 or 29 rays, nearly as long as head, longer than pelvics, which reach vent or origin of anal. Caudal rounded or subtruncate; caudal peduncle as long as or longer than deep. Brownish, with irregular darker cross-bars; inside of mouth and branchial cavities blackish; sometimes an indistinct dark blotch on spinous dorsal.

Hab. Graham Land; Queen Mary Land; Adelie Land; South Victoria Land.

This species was originally described from 3 specimens: 1 (132 mm. in total length) from south-west of the Balleny Islands, 476 metres; 1 (65 mm.) from Tent Island, near Ross Island; and 1 (about 65 mm.) from Seymour Island, collected in tide-pools. It is closely related to *T. hansonii*, but may be distinguished from that species by the smaller number of dorsal and anal rays, and by the presence (usually) of tubular scales in the lower lateral line. Further, Waite has pointed out that in life this species is reddish in colour, whereas *T. hansonii* is greenish or greyish. As a general rule, *T. loennbergii* appears to live in deeper water than *T. hansonii*.

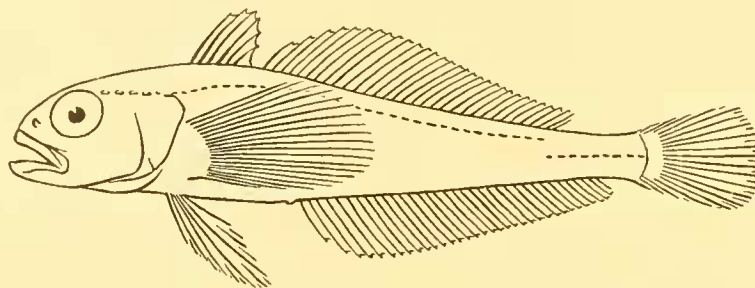


Fig. 20. *Trematomus loennbergii*. $\times \frac{1}{2}$.

Trematomus pennellii, Regan.

Trematomus pennellii, Regan, 1914, *Ann. Mag. Nat. Hist.*, (8) XIII, p. 12; 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.*, 1910, Zool. 1 (1), p. 4, pl. iii, fig. 2; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 20.

Depth of body $4\frac{1}{2}$ to 5 in the length, length of head $3\frac{1}{3}$ to $3\frac{1}{2}$. Snout as long as or rather shorter than eye, diameter of which is $3\frac{1}{4}$ to $3\frac{1}{2}$ in length of head; interorbital width 8 to 10. Jaws equal anteriorly; maxillary extending to below anterior $\frac{1}{4}$ of eye; occiput, interorbital region, cheeks and opercles scaly; 13 to 16 gill-rakers on lower part of anterior arch. Scales on body ctenoid; 52 to 56 in a longitudinal series from above base of pectoral to caudal; 32 to 36 in upper lateral line, which ends below posterior part of dorsal; lower lateral line without tubular scales. Dorsal IV–VI, 32–35; spines flexible. Anal 29–31. Pectoral with 24 or 25 rays, $\frac{3}{4}$ or $\frac{4}{5}$ length of head, as long as or longer than pelvics, which reach origin of anal. Caudal subtruncate; caudal peduncle as long as deep. Olivaceous, with two or three series of large dark spots, which may unite to form irregular cross-bars; distal part of spinous dorsal blackish.

Hab. Queen Mary Land; South Victoria Land.

The types of the species, 5 specimens 100 to 140 mm. in total length, are from off Cape Adare, 82 to 94 metres. Waite has recorded 10 specimens, up to 180 mm. in length, from off Drygalski Island, 112 metres.

Trematomus centronotus, Regan.

Trematomus centronotus, Regan, 1914, *Ann. Mag. Nat. Hist.*, (8) XIII, p. 12; 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.*, 1910, Zool. 1 (1), p. 4, pl. iii, fig. 1; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 21; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, I, p. 70.

Depth of body 4 to 5 in the length, length of head $3\frac{1}{4}$ to $3\frac{3}{5}$. Snout shorter than eye, diameter of which is $2\frac{3}{4}$ (young) to $3\frac{1}{4}$ in length of head; interorbital width 10 to 12. Jaws equal anteriorly; maxillary extending to below anterior $\frac{1}{4}$ or $\frac{1}{3}$ of eye; occiput, interorbital region, cheeks and opercles scaly; 13 to 15 gill-rakers on lower part of anterior arch. Scales on body cycloid or rather feebly ctenoid; 52 to 56 in a longitudinal series from above base of pectoral to caudal; 30 to 39 in upper lateral line, which ends below posterior part of dorsal; lower lateral line without tubular scales. Dorsal V–VI, 32–36; spines stiff, pungent. Anal 29–32. Pectoral with 24 or 25 rays, $\frac{3}{5}$ to $\frac{4}{5}$ length of head, a little shorter than pelvics, which extend to origin of anal. Caudal apparently subtruncate; caudal peduncle about as long as deep. Brownish, with large dark spots, uniting to form irregular cross-bars; a black spot on distal part of spinous dorsal.

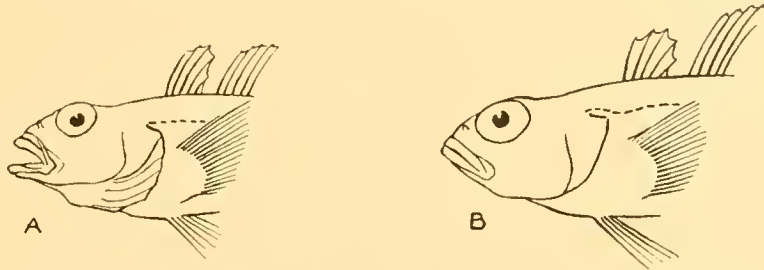


Fig. 21. Lateral view of head of A, *Trematomus pennellii*; B, *T. centronotus*. $\times \frac{1}{2}$.

Hab. Mac-Robertson Land; Queen Mary Land; Adelie Land; South Victoria Land.

The types of this species, 2 specimens 175 and 210 mm. in total length, are from McMurdo Sound, 187 to 375 metres. It is very like *T. pennellii*, and, apart from the stiff and pungent dorsal spines, it scarcely differs from that species except in the larger eye. *T. centronotus* appears to be found in rather deeper water than *T. pennellii*.

Trematomus scotti (Boulenger).

Notothenia scotti, Boulenger, 1907, *Nat. Antarct. Exped. Nat. Hist.*, 11, Fish., p. 2, pl. i, fig. 1; Roule, Angel and Despax, 1913, *Deux. Expéd. Antarct. Franç.* (1908–1910), Poiss., p. 5; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 271.

Trematomus scotti, Regan, 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.*, 1910, Zool. 1 (1), p. 4, pl. iv, fig. 2; Waite, 1916, *Anstral. Antarct. Exped. Sci. Rep.*, Ser. C, 111 (1), Fishes, p. 21; Norman, 1937, *t.c.*, p. 70.

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago. Nets (4 mm. and 7 mm. mesh) attached to back of trawl, 160–235 m.: 6 specimens, 95–145 mm.

St. 187. 18. iii. 27. Neumayr Channel, Palmer Archipelago. Large dredge, 259 m.: 1 specimen, 145 mm.

St. 190. 24. iii. 27. Bismarck Strait, Palmer Archipelago. Large dredge, 315 m.: 1 specimen, 68 mm.

St. 599. 17. i. 31. $67^{\circ} 08' S$, $69^{\circ} 06\frac{1}{2}' W$. Large dredge, 203 m.: 3 specimens, 70–125 mm.

St. 1652. 23. i. 26. $75^{\circ} 56.2' S$, $178^{\circ} 35.5' E$. Rectangular dredge, with Russell net, 567 m.: 1 specimen, 130 mm.

St. 1660. 27. i. 36. $74^{\circ} 46.4' S$, $178^{\circ} 23.4' E$. Large otter trawl, 351 m.: 11 specimens, 61–145 mm.

Depth of body 4 to $5\frac{1}{2}$ in the length, length of head 3 to $3\frac{3}{4}$. Snout shorter than eye, diameter of which is $2\frac{4}{5}$ to $3\frac{1}{3}$ in length of head; interorbital width about 12. Jaws about equal anteriorly; maxillary extending to below anterior $\frac{1}{4}$ of eye; occiput, interorbital region, cheeks and opercles scaly; preorbital sometimes scaly, sometimes incompletely scaled or nearly naked; 10 to 13 gill-rakers on lower part of anterior arch. Scales on body ctenoid; 46 to 54 in a longitudinal series from above base of pectoral to caudal; 10 to 23 in upper lateral line, which rarely extends beyond extremity of pectoral fin; lower lateral line without tubular scales. Dorsal IV–VI, 31–36. Anal 29–33. Pectoral with 20 to 22 rays, $\frac{3}{5}$ to $\frac{3}{4}$ head, about as long as pelvics, which reach vent or anal fin. Caudal rounded; caudal peduncle as long as deep or rather deeper than long. Brownish, with dark spots or irregular cross-bars; spinous dorsal with a deep black blotch; soft dorsal and anal with a blackish band which is broadest and most intense posteriorly, that on the dorsal sometimes reduced to a deep black blotch on posterior part of fin; caudal, pectorals and pelvics often barred.

Hab. Graham Land and neighbouring islands; South Shetlands; Enderby Land; Mac-Robertson Land; Princess Elizabeth Land; Queen Mary Land; South Victoria Land; near King Edward Land.

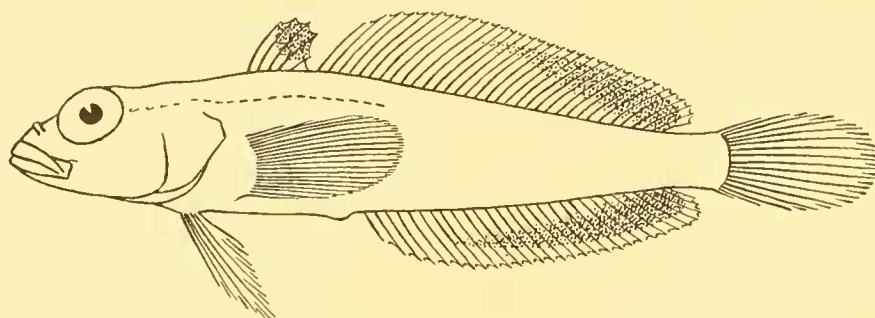


Fig. 22. *Trematomus scotti*. $\times \frac{3}{4}$.

The type of the species, 110 mm. in total length, is from off the Ross Barrier at a depth of 562 metres. The above description is based upon a large number of specimens, up to 180 mm. in total length, obtained by the 'Terra Nova', 'Discovery' and the B.A.N.Z. Antarctic Research Expedition. The species seems to occur mainly in fairly deep water.

Trematomus lepidorhinus (Pappenheim).

Notothenia lepidorhinus (part), Pappenheim, 1911, *Ges. nat. Freunde Berlin*, No. 8, p. 382; 1912, *Deutsche Südpol.-Exped.*, xiii, Zool. v, p. 169, pl. ix, fig. 1, pl. x, fig. 1; Regan, 1913, *t.c.*, p. 270; Norman, 1937, *t.c.*, p. 71.

Trematomus lepidorhinus, Regan, 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.*, 1910, Zool. 1 (1), p. 5, pl. iv, fig. 1.

St. 1660. 27. i. 36. $74^{\circ} 46.4' S$, $178^{\circ} 23.4' E$. Large otter trawl, 351 m.: 1 specimen, 280 mm.

Depth of body 4 to $4\frac{2}{3}$ in the length, length of head $3\frac{1}{2}$ to $3\frac{3}{4}$. Vent much nearer to tip of snout than to end of anal fin. Snout nearly as long as eye, diameter of which is

3 to $3\frac{2}{3}$ in length of head; interorbital width about 6. Mouth nearly horizontal; jaws about equal anteriorly; maxillary extending to below anterior edge of pupil; upper surface and sides of head, including snout and preorbital, scaly; 14 to 16 gill-rakers on lower part of anterior arch. Scales on body ctenoid; 72 to 80 in a longitudinal series from above base of pectoral to caudal; 43 to 56 in upper lateral line, which ends behind dorsal or below its posterior rays; 26 to 38 in lower lateral line. Dorsal VI-VII, 31-33. Anal 34-36. Pectoral with 27 to 29 rays, as long as or nearly as long as head, longer than pelvics, which reach vent or anterior rays of anal. Caudal rounded or subtruncate; caudal peduncle somewhat deeper than long. Brownish, with irregular and somewhat indistinct darker cross-bars; spinous dorsal blackish; soft dorsal with dark oblique stripes. The specimen collected by the Discovery Committee has the inside of the mouth and the branchial cavities blackish.

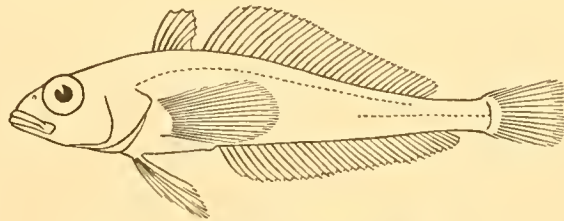


Fig. 23. *Trematomus lepidorhinus*. $\times \frac{1}{2}$.

Hab. Mac-Robertson Land; Wilhelm Land; South Victoria Land.

The types, up to 240 mm. in total length, were taken at the Winter Quarters of the 'Gauss', at a depth of 385 metres. There are 3 specimens, 135 to 150 mm. in total length, in the British Museum collection, taken by the 'Terra Nova' from off new land south of the Balleny Islands at a depth of 375 metres.

Trematomus eulepidotus, Regan.

Trematomus eulepidotus, Regan, 1914, *Ann. Mag. Nat. Hist.*, (8) xiii, p. 12; 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.*, 1910, Zool. 1 (1), p. 5, pl. iv, fig. 3; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 22; Norman, 1937, *t.c.*, p. 71.

St. 167. 20. ii. 27. Off Signy Island, South Orkneys. Net (7 mm. mesh) attached to back of trawl, 244-344 m.: 4 specimens, 90-190 mm.

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago. Large otter trawl, 160-335 m.: 1 specimen, 163 mm.

St. 1660. 27. i. 36. $74^{\circ} 46.4' S$, $178^{\circ} 23.4' E$. Large otter trawl, 351 m.: 1 specimen, 255 mm.

Depth of body $3\frac{1}{2}$ to $4\frac{1}{2}$ in the length, length of head $3\frac{1}{4}$ to $3\frac{3}{4}$. Vent nearly equidistant from tip of snout and end of anal fin. Snout shorter than eye, diameter of which is $3\frac{1}{4}$ to $3\frac{3}{4}$ in length of head; interorbital width $4\frac{1}{2}$ to $5\frac{1}{2}$. Mouth oblique; jaws about equal anteriorly; maxillary extending to below anterior $\frac{1}{4}$ of eye; head covered with scales, only the lips naked; 12 to 15 gill-rakers on lower part of anterior arch. Scales on body ctenoid; 67 to 76 in a longitudinal series from above base of pectoral to caudal; 40 to 48 in upper lateral line, which generally ends below posterior rays of dorsal; 10 to 22 in lower lateral line. Dorsal VI-VII, 34-37. Anal 32-34. Pectoral with 27 or 28 rays, $\frac{3}{4}$ to $\frac{7}{8}$ length of head, longer than pelvics, which reach vent or origin of anal. Caudal subtruncate; caudal peduncle as long as or nearly as long as deep. Pale brownish; sides of body with dark spots connected to form a network; spinous dorsal more or less dusky or blackish distally; soft dorsal with oblique dark stripes.

Hab. Palmer Archipelago, Graham Land; South Orkneys; Enderby Land; MacRobertson Land; Queen Mary Land; South Victoria Land.

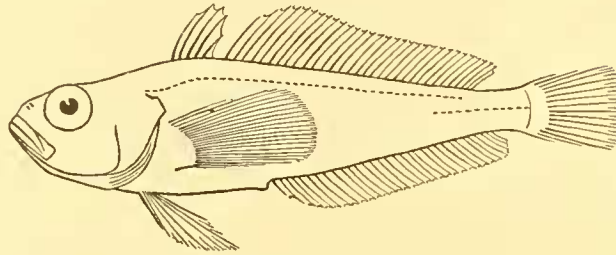


Fig. 24. *Trematomus eulepidotus*. $\times \frac{1}{2}$.

The types of this species, 140 and 165 mm. in total length, are from the entrance to McMurdo Sound, 300 metres, and from near Inaccessible Island, 416 to 452 metres. *Trematomus eulepidotus* is closely related to *T. lepidorhinus*, but differs in the shorter snout, broader interorbital region, more oblique mouth, shorter tail, more numerous dorsal rays, and much shorter lower lateral line.

Genus DISSOSTICHUS

Dissostichus, Smitt, 1898, *Bih. Sv. Vet.-Akad. Handl.*, xxiv, iv, No. 5, p. 3; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 279; Norman, 1937, *Discovery Rep.*, xvi, p. 91. Type *Dissostichus eleginoides*, Smitt.

Differs from *Trematomus* in the longer snout and strongly projecting lower jaw; teeth in the upper jaw biserial, those of the outer row enlarged, spaced, canine-like; a group of stronger teeth on each praemaxillary; teeth of lower jaw uniserial, spaced, canine-like.

Two species; one from the Patagonian region, one from the Antarctic Zone.

Coasts of the Antarctic Continent and northwards to the Patagonian region and the coast of Argentina.

Dissostichus mawsoni, Norman.

Dissostichus eleginoides (non Smitt), Vaillant, 1906, *Bull. Mus. Paris*, 1906, No. 3, p. 139; 1906, *Expéd. Antarct. Franç.* (1903-1905), Poiss., p. 36.

Dissostichus mawsoni, Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped*, Ser. B, i, p. 71, fig. 6.

Depth of body $5\frac{1}{2}$ to nearly 6 in the length, length of head about 3. Snout $1\frac{1}{4}$ to $1\frac{3}{5}$ times as long as eye, diameter of which is 4 to $5\frac{1}{4}$ in length of head; interorbital width $4\frac{1}{2}$ to 5. Maxillary extending to below middle of eye or a little beyond; upper surface of head to below middle or anterior edges of eyes, cheeks and opercles scaly; no elongate naked areas on upper surface of head; 12 or 13 gill-rakers on lower part of anterior arch. 135 to 150 scales in a longitudinal series from above base of pectoral to caudal; 90 to 96 in upper lateral line, which ends below posterior rays of dorsal; 35 to 38 in lower lateral line, which does not extend forward as far as level of middle of anal fin. Dorsal VIII-IX, 25-27. Anal 25-26. Pectoral with 27 to 29 rays, nearly $\frac{3}{4}$ length of head, much longer than pelvics, which do not nearly reach vent. Caudal truncate or a little rounded; caudal peduncle longer than deep. More or less uniformly brownish,

or with 4 irregular and incomplete dark cross-bars and with some dark spots; spinous dorsal blackish distally, sometimes with a dark horizontal band near the base; traces of oblique dark stripes on soft dorsal and anal; caudal pectorals and pelvics plain.

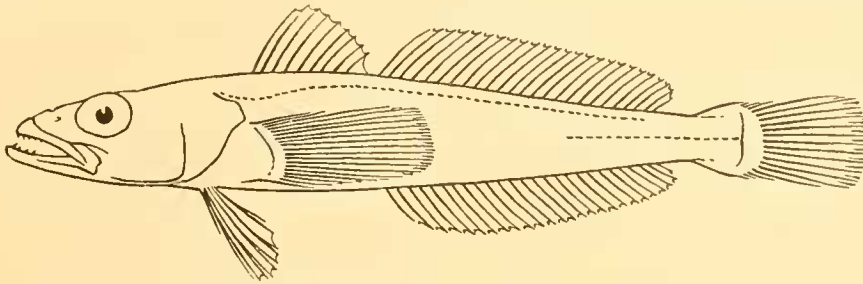


Fig. 25. *Dissostichus marwsoni*. $\times$ about $\frac{1}{2}$.

Hab. Graham Land; off Mac-Robertson Land.

The type of the species, 370 mm. in total length, is from 66° 45' S, 62° 03' E, at a depth of 219 metres. The specimens collected by the 'Français' are from Booth Wandell Island, 20 to 30 metres. I have examined four of these in the Paris Museum (No. 06—140—143), 212 to 262 mm. in total length, and, although the skin has been largely rubbed off the head region, I have little doubt that they are referable to this species.¹

Dissostichus marwsoni may be readily distinguished from the Patagonian *D. eleginoides* by the absence of the elongate naked areas on the upper surface of the head, the less completely scaled interorbital region, the somewhat smaller scales on the body, and the shorter lower lateral line.

Genus PLEURAGRAMMA

Pleuragramma, Boulenger, 1902, *Rep. Coll. Nat. Hist.* 'Southern Cross', p. 187; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 264. Type *Pleuragramma antarcticum*, Boulenger.

Gelidus, Whitley, 1937, *Rec. Austral. Mus.*, XX, p. 19. Type *Pleuragramma antarcticum*, Boulenger.

Body covered with very thin, cycloid scales; 3 lateral lines; each lateral line scale with a notched hinder margin and with a vertical row of three shallow pits. Mouth of moderate size, the lower jaw strongly projecting; jaws with bands of villiform teeth; one or two pairs of somewhat larger teeth at the premaxillary symphysis. Snout flattened, but not spatulate. Gill-membranes narrowly united, free from the isthmus. Skeleton feebly ossified, with parapophyses developed only on the posterior precaudal vertebrae; vertebrae 53 (19 + 34); hypercoracoid enclosing its foramen.

A single species.

Coasts of the Antarctic Continent.

There would appear to be no justification for the introduction of a new name for this genus, since, under the International Rules of Nomenclature, *Pleuragramma*, Boulenger, cannot be regarded as invalidated by *Pleurogrammus*, Gill. Further, the

¹ One of these specimens has now been received in exchange from the Paris Museum

meanings of the two words are quite different, Gill's genus being for a fish with 5 lateral lines on each side, Boulenger's for a fish believed to be without any lateral line. Mr Whitley has also erected a new family (Gelididae) for its reception, pointing out that Boulenger was in error in placing this fish in the family Leptoscopidae. Regan, however, in his monograph of the Nototheniiformes published in 1913, has clearly demonstrated the close affinities of *Pleuragramma* and *Trematomus*.

***Pleuragramma antarcticum*, Boulenger.**

Pleuragramma antarcticum, Boulenger, 1902, *t.c.*, p. 187, pl. xviii; Lönnberg, 1905, *Wiss. Ergebn. Schwed. Südpol.-Exped.*, v (6), p. 49; Vaillant, 1906, *Bull. Mus. Paris*, 1906, No. 3, p. 139; 1906, *Expéd. Antarct. Franç.* (1903-1905), Poiss., p. 48, figs. 3, 4; Boulenger, 1907, *Nat. Antarct. Exped. Nat. Hist.*, 11, Fish., p. 4; Waite, 1911, *Brit. Antarct. Exped.*, 1907-1909, 11, Biol., 11, p. 14; Pappenheim, 1912, *Deutsche Südpol.-Exped.*, xiii, Zool. v, p. 164; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 264; 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.* 1910, Zool. 1 (1), p. 6; 1916, *ibid.* Zool. 1 (4), p. 131, pl. ii, figs. 3-6; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, 111 (1), Fishes, p. 22; Nichols and LaMonte, 1936, *Amer. Mus. Novit.*, 839, p. 1; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, 1, p. 72.

Gelidus antarcticus, Whitley, 1937, *Rec. Austral. Mus.*, xx, p. 20, fig. 5.

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago. Nets (4 mm. and 7 mm. mesh) attached to back of trawl, 160-335 m.: 1 specimen, 160 mm.

St. 182. 14. iii. 27. Schollaert Channel, Palmer Archipelago. Large otter trawl, 278-500-m.: 1 specimen, 200 mm.

St. WS 506. 7. ii. 30. 70° 31' S, 81° 36' W. Picked up dead at surface: 1 specimen, 185 mm.

St. —. 20. i. 36. Bay of Whales (78° 24.85' S, 164° 10.3' W). Picked up dead at surface: 1 specimen, 173 mm.

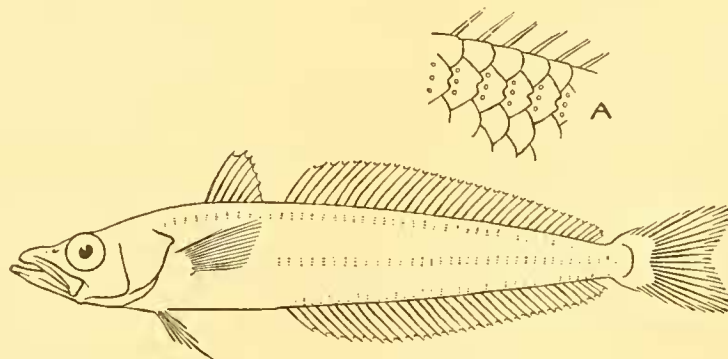


Fig. 26. *Pleuragramma antarcticum*. $\times \frac{1}{2}$. A, Lateral line scales (enlarged).

Depth of body 5 to 6 in the length, length of head $3\frac{1}{2}$ to 4. Snout as long as or longer than eye, diameter of which is $3\frac{1}{4}$ to 4 in length of head; interorbital width 5 to 6. Maxillary extending to below anterior $\frac{1}{3}$ of eye; upper surface of head naked; cheeks and opercles scaly; 20 to 25 gill-rakers on lower part of anterior arch. 50 to 58 scales in a longitudinal series from above base of pectoral to caudal; about 45 notched scales in upper lateral line, which ends below last rays of dorsal; about 35 in both middle and lower lateral lines. Dorsal VI-VII, 33-38. Anal 36-39. Pectoral with 20 or 21 rays, $\frac{1}{2}$ to $\frac{3}{5}$ length of head, as long as or longer than pelvics, which scarcely reach the

vent. Caudal slightly emarginate; caudal peduncle about as deep as long. Silvery, back darker; back and sides powdered with blackish dots; fins all pale.

Hab. Circumpolar in the Glacial District (see p. 97).

The types of the species, up to 165 mm. in total length, are from the ice barrier, Victoria Land, at 78° 35' S. Regan has described and figured several larval and post-larval specimens from the Ross Sea and the coast of Victoria Land, and points out that in these the eye is proportionately smaller than in the adult fish, no doubt because the latter descend to greater depths. He has shown that larval and post-larval examples have been taken not far from the coast and at depths not exceeding 80 metres; young fish (30 to 35 mm.) in the Ross Sea at a depth of 356 metres. The B.A.N.Z. Antarctic Research Expedition obtained larger young (65 to 82 mm.) in 66° 36.5' S, 141° 44' E, with tow-nets hauled obliquely from 0 to 111 metres, and in 68° 14' S, 70° 11' E, with hand-nets at the surface (the fish being frozen and seen floating past the ship). The 'Aurora' obtained many young (*c.* 70 mm.) in 66° 8' S, 94° 17' E, at a depth of 20 metres. Adults have been taken at various localities, and generally at depths ranging from about 150 to 500 metres. A number of specimens have been recorded frozen on the ice barrier or at the surface of the sea, and others have been taken from the stomachs of seals or penguins.

Family HARPAGIFERIDAE

Closely related to the Nototheniidae, but with the body naked; two lateral lines, the upper always with tubules, the lower sometimes reduced to a series of pores; gill-membranes broadly united to the isthmus, not forming a fold across it; operculum hooked upwards posteriorly, its upper edge deeply concave.

Five genera, all occurring in the Antarctic Zone, and one (*Harpagifer*) extending into the Subantarctic Zone.

Key to the Genera

- I. A mental barbel present; opercles not spinate.
 - A. Post-temporal not prominent; head not or scarcely broader than deep; interorbital region narrow.
 1. Spinous dorsal fin above base of pectoral 1. *ARTEDIDRACO*.
 2. Spinous dorsal fin above operculum 2. *DOLLOIDRACO*.
 - B. Upper limb of post-temporal projecting as a prominent curved ridge; spinous dorsal fin above operculum.
 1. Head longer than broad, scarcely broader than deep; interorbital region narrow.
 3. *HISTIODRACO*.
 2. Head nearly as broad as long, much broader than deep; interorbital region wide or rather wide 4. *POGONOPHRYNE*.
- II. No mental barbel; operculum and suboperculum each forming a prominent spine.
 5. *HARPAGIFER*.

Genus *ARTEDIDRACO*

Artedidraco, Lönnberg, 1905, *Wiss. Ergebn. Schwed. Südpol.-Exped.*, v (6), p. 39; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 280. Type *Artedidraco skottsbergi*, Lönnberg.

A comparatively short upper lateral line with tubules; lower lateral line reduced to a series of pores. Head not or scarcely broader than deep; snout shorter than eye;

interorbital region narrow; post-temporal not prominent; opercles not spinate. Mouth of moderate size; a mental barbel present; teeth in villiform bands, without distinct canines. Spinous dorsal fin placed above the base of the pectoral. Vertebrae 38 (15+23).

Five species.

Coasts of the Antarctic Continent, extending northwards in the Weddell Quadrant to South Georgia.

Key to the Species

- I. Maxillary not extending beyond anterior $\frac{1}{3}$ of eye; dorsal II-IV, 23-28; anal 16-21.
 - A. Eye $3\frac{1}{2}$ to 4 in head; barbel club-shaped, with papillose terminal knob, in the male, without distal expansion in the female, its length from less than $\frac{1}{4}$ to nearly $\frac{1}{3}$ that of head.
 1. Depth 4 to $4\frac{1}{3}$ in length; last ray of anal joined or nearly joined to base of caudal; pelvic fins not nearly reaching vent ... 1. *mirus*.
 2. Depth 5 to $5\frac{1}{2}$ in length; last ray of anal separated by an interspace from caudal; pelvic fins reaching vent or origin of anal ... 2. *orianae*.
 - B. Eye $2\frac{4}{5}$ to $3\frac{2}{5}$ in head; barbel without distal expansion in both sexes, either smooth, finely papillose, or slightly fringed, its length never more than $\frac{1}{4}$ that of head.
 1. Caudal fin rounded or subtruncate; dorsal II-IV, 24-27 ... 3. *skottsbergi*.
 2. Caudal fin slightly emarginate; dorsal II-III, 26-28 ... 4. *loennbergi*.
- II. Maxillary extending to or nearly to below middle of eye; dorsal III-V, 27-30; anal 19-20; eye $3\frac{1}{2}$ to $3\frac{3}{4}$ in head; barbel smooth, tapering, its length $\frac{1}{5}$ to more than $\frac{1}{4}$ that of head.
 5. *shackletoni*.

Artedidraco mirus, Lönnberg.

Artedidraco mirus, Lönnberg, 1905, *Wiss. Ergebn. Schwed. Südpol.-Exped.*, v (6), p. 40, pl. i, fig. 4, pl. iv, fig. 14; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 280.

St. MS 71. 9. iii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 110-60 m.: 1 specimen, 73 mm.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia. Large otter trawl, 179-235 m.: 1 specimen, 100 mm.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 120-204 m.: 1 specimen, 93 mm.

St. WS 25. 17. xii. 26. Undine Harbour (North), South Georgia. Small beam trawl, 18-27 m.: 2 specimens, 65, 70 mm.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia. Large otter trawl, 122-136 m.: 12 specimens, 33-107 mm.

St. 142. 30. xii. 26. East Cumberland Bay, South Georgia. Net (7 mm. mesh), attached to back of trawl, 88-273 m.: 1 specimen, 105 mm.

St. 148. 9. i. 27. Off Cape Saunders, South Georgia. Large otter trawl, with net (4 mm. mesh) attached, 132-148 m.: 2 specimens, 92, 100 mm.

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia. Large otter trawl, 200-234 m.: 4 specimens, 95-115 mm.

Depth of body 4 to $4\frac{1}{3}$ in the length, length of head $2\frac{3}{4}$ to a little more than 3. Diameter of eye $3\frac{1}{2}$ to 4, interorbital width about 9 in length of head. Maxillary extending to below anterior $\frac{1}{4}$ or $\frac{1}{3}$ of eye; barbel from less than $\frac{1}{4}$ to nearly $\frac{1}{3}$ length of head, with a papillose terminal knob in the male, smooth and without distal expansion in the female; 6 or 7 gill-rakers on lower part of anterior arch. Upper lateral line short,

ending below anterior part of soft dorsal. Dorsal III, 23–25; middle rays of soft dorsal longest, the last joined to base of caudal; fins higher in adult males. Anal 16–18; last ray joined or nearly joined to base of caudal. Pectoral with 16 or 17 rays, $1\frac{2}{3}$ to $1\frac{3}{4}$ in length of head, extending to above vent or origin of anal; pelvics a little shorter, not nearly reaching vent. Caudal subtruncate or rounded. Four dark cross-bars on back, extending upwards on the dorsal fins, the first at the base of the spinous dorsal, the second small and inconspicuous; a dark patch on preorbital and another on cheek; lower parts of body irregularly spotted and marbled; fins with series of spots, the dorsal sometimes more or less dusky, the anal blackish with a pale margin; all the markings sometimes very faint.

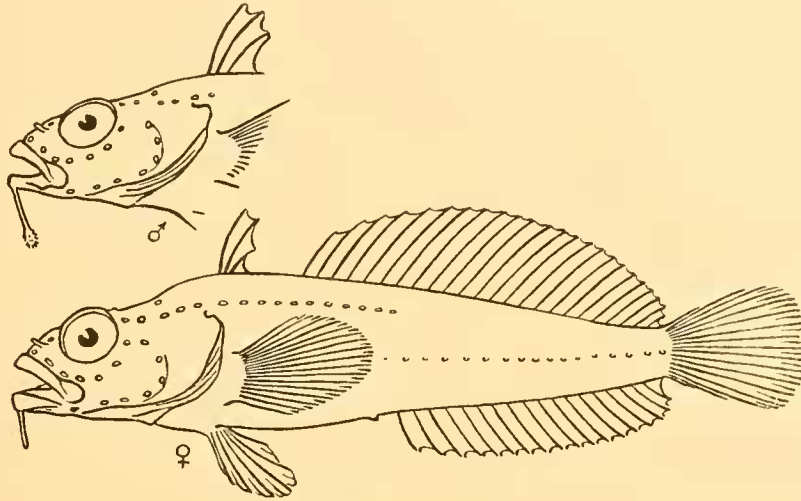


Fig. 27. *Artedidraco mirus*. $\times 1$.

Hab. South Georgia.

This species was originally described from 4 specimens, 40 to 92 mm. in length without the caudal fin, from Antarctic Bay and Cumberland Bay, at depths varying from 22 to 250 metres. It was not previously represented in the British Museum collection.

Artedidraco orianae, Regan.

Artedidraco orianae, Regan, 1914, *Ann. Mag. Nat. Hist.*, (8) XIII, p. 12; 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.*, 1910, Zool. 1 (1), p. 7, pl. vi, fig. 2.

Depth of body 5 to $5\frac{1}{2}$ in the length, length of head $2\frac{5}{6}$ to 3. Diameter of eye $3\frac{1}{2}$, interorbital width 10 in length of head. Maxillary extending to below anterior $\frac{1}{4}$ of eye; barbel $\frac{1}{4}$ length of head, club-shaped, with papillose distal expansion; 7 short gill-rakers on lower part of anterior arch. Upper lateral line of moderate length, extending to or nearly to below middle of soft dorsal. Dorsal III–IV, 25; rays of soft dorsal decreasing from third or fourth; last adnate to caudal peduncle. Anal 17–18; separated by an interspace from caudal fin. Pectoral with 17 rays, $\frac{5}{7}$ or $\frac{3}{4}$ length of head, extending to above third or fourth ray of anal; pelvics as long, extending to vent or origin of anal.

Caudal subtruncate. Five dark bars on back, extending upwards on the dorsal fins, the first at base of spinous dorsal, the second and fourth stronger than the rest; a spot on praeorbital, another on cheek; lower part of body irregularly spotted; fins with series of spots.

Hab. South Victoria Land.

Known only from the types, 2 specimens, each 80 mm. in total length, from off Cape Adare, 85 to 95 metres.

***Artedidraco skottsbergi*, Lönnberg.**

Artedidraco skottsbergi, Lönnberg, 1905, *t.c.*, p. 48, pl. iv, fig. 15; Regan, 1913, *t.c.*, p. 280; Vaillant, 1906, *Bull. Mus. Paris*, 1906, No. 3, p. 139; 1906, *Expéd. Antarct. Franç.* (1903–1905), Poiss., p. 46; Regan, 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.* 1910, Zool. 1 (1), p. 7, pl. v, fig. 1; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, 1, p. 73.

St. 599. 17. i. 31. 67° 08' S, 69° 06½' W. Large dredge, 203 m.: 1 specimen, 85 mm.

Depth of body $4\frac{1}{2}$ to nearly 6 in the length, length of head 3 to $3\frac{1}{2}$. Diameter of eye 3 to $3\frac{3}{5}$, interorbital width about 14 to 20 in length of head. Maxillary extending to below anterior $\frac{1}{5}$ or $\frac{1}{4}$ of eye; barbel less than $\frac{1}{2}$ diameter of eye, simple, smooth or finely papillose; 7 gill-rakers on lower part of anterior arch. Dorsal II–IV, 24–27; middle soft rays longest. Anal 17–20. Last rays of dorsal and anal joined or nearly joined to base of caudal. Pectoral with 15 to 17 rays, $1\frac{1}{6}$ to $1\frac{2}{5}$ in length of head, extending to above vent or origin of anal; pelvics shorter, scarcely reaching vent in young, not as far in adult. Caudal rounded or subtruncate. Body with numerous irregular dark spots; a series of blotches at base of dorsal fin sometimes continued on sides of body as bars; vertical fins with series of spots on the rays, those on posterior part of dorsal and anal and near upper and lower edges of caudal deep black; pectorals barred.

Hab. Graham Land; South Shetlands; Enderby Land; Mac-Robertson Land; South Victoria Land.

The type of the species, 57 mm. in length without the caudal fin, was taken south of Snow Hill, Graham Land, at a depth of 125 metres. In addition to the specimen collected by the Discovery Committee, the above description is based upon 18 specimens in the British Museum collection, up to 120 mm. in total length, and 13 others, 45 to 107 mm. long, collected by the B.A.N.Z. Antarctic Research Expedition. I have also seen a specimen, 70 mm. in total length, in the Paris Museum (No. 06—152). This is from Booth Wandel Island, at a depth of 40 metres.

***Artedidraco loennbergi*, Roule.**

Artedidraco loennbergi, Roule, 1913, *Bull. Mus. Paris*, 1913, No. 1, p. 4.

Artedidraco loenbergi, Roule, Angel and Despax, 1913, *Deux. Expéd. Antarct. Franç.* (1908–1910), Poiss., p. 13, pl. iv, fig. 4.

Artedidraco loennbergii, Regan, 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.* 1910, Zool. 1 (1), p. 8, pl. v, fig. 2.

Depth of body 5 to 6 in the length, length of head $2\frac{3}{4}$ to $4\frac{1}{4}$. Diameter of eye $2\frac{4}{5}$ to $3\frac{1}{2}$, interorbital width 15 to 20 in length of head. Maxillary extending to below

anterior $\frac{1}{4}$ of eye; barbel $\frac{1}{7}$ to $\frac{1}{4}$ length of head, simple or slightly fringed distally; 6 or 7 gill-rakers on lower part of anterior arch. Dorsal II–III, 25–28. Anal 18–21. Soft dorsal and anal usually highest posteriorly, their last rays joined or nearly joined to base of caudal. Pectoral with 14 to 16 rays, $1\frac{2}{3}$ to $1\frac{3}{8}$ in length of head, extending to above anal in young but not in adult; pelvics as long as or a little shorter than pectorals, reaching vent in young but not in adult. Caudal slightly emarginate. A series of dark blotches at base of dorsal fin and sometimes at base of anal; a dark lateral band, made up of irregular spots, from eye to caudal fin; pale bands above and below it are continued along the upper and lower margins of the caudal fin; dorsal and middle of caudal with spots on the rays; pectorals usually barred.

Hab. Graham Land; South Victoria Land.

The type of the species, 93 mm. in total length, was collected by the 'Pourquoi Pas?' near Marguerite Bay ($68^{\circ}00'S$, $70^{\circ}20'W$), at a depth of 230 metres. I have examined this type in the Paris Museum (No. 13—186). It has a somewhat larger eye than is seen in examples from Victoria Land, but appears to be otherwise identical. The 'Terra Nova' obtained 22 specimens, measuring up to 110 mm. in total length, from: Ross Sea, $74^{\circ}25'S$, $179^{\circ}3'E$, 295 metres; off new land south of the Balleny Islands, 375 metres; entrance to McMurdo Sound, $76^{\circ}56'S$, $164^{\circ}12'E$, 300 metres and $77^{\circ}13'S$, $164^{\circ}18'E$, 380 metres; and near Inaccessible Island, 415 to 450 metres.

***Artedidraco shackletoni*, Waite.**

Artedidraco shackletoni, Waite, *Brit. Antarct. Exped.* 1907–1909, 11, Biol., 11, p. 15, pl. ii; Regan, 1914, *t.c.*, p. 8; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser C, 111 (1), Fishes, p. 23; Norman, 1937, *t.c.*, p. 73.

Depth of body 4 to 5 in the length, length of head $2\frac{3}{4}$ to nearly 3. Diameter of eye $3\frac{1}{2}$ to $3\frac{3}{4}$, interorbital width about 14 in length of head. Maxillary extending to below middle of eye or not quite as far; barbel as long as or nearly as long as diameter of eye and $\frac{1}{5}$ to more than $\frac{1}{4}$ length of head, smooth, tapering; 6 or 7 gill-rakers on lower part of anterior arch. Dorsal III–IV (V), 27–30; middle soft-rays longest. Anal 19 or 20. Last rays of dorsal and anal joined to base of caudal. Pectoral with 15 to 17 rays, $1\frac{2}{5}$ to $1\frac{3}{4}$ in length of head, extending to above vent or origin of anal; pelvics as long or shorter, not reaching vent (except in young). Caudal subtruncate. Pale brownish, uniform or with three dark brown bars on the back; lower parts of hinder portion of body sometimes spotted with brown; caudal and pectoral fins spotted, and sometimes traces of spots on the other fins; often a dusky band along base of anal fin.

Hab. Enderby Land; Mac-Robertson Land; Queen Mary Land; South Victoria Land.

The type of the species, 146 mm. in length, was from off Cape Royds, at a depth of 56 to 150 metres. Two specimens (132 and 142 mm.) in the British Museum collection, from the entrance to McMurdo Sound, and 6 specimens (65 to 120 mm.) collected by the B.A.N.Z. Antarctic Research Expedition are also included in the above description.

Genus DOLLOIDRACO

Dolloidraco, Roule, 1913, *Bull. Mus. Paris*, 1913, No. 1, p. 5; Roule, Angel and Despax, 1913, *Deux. Expéd. Antarct. Franç.* (1908–1910), Poiss., p. 15. Type *Dolloidraco longedorsalis*, Roule.

Differs from *Artedidraco* in having the spinous dorsal fin placed above the operculum.

A single species.

Coasts of the Antarctic Continent.

Dolloidraco longedorsalis, Roule.

Dolloidraco longedorsalis, Roule, 1913, *Bull. Mus. Paris*, 1913, No. 1, p. 6; Roule, Angel and Despax, 1913, *t.c.*, p. 16, pl. iv, figs. 1–3; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 24, pl. i, fig. 2, text-fig. 3.

Dolloidraco longidorsalis, Regan, 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.* 1910, Zool. 1 (1), p. 28.

St. 1644. 16. i. 36. Bay of Whales (78° 24' 85" S, 164° 10' 3" W). Russell Bottom Net, 626 m.: 1 female specimen, 115 mm.

Depth of body about 5 in the length, length of head $2\frac{1}{2}$ to $2\frac{4}{5}$. Diameter of eye $2\frac{1}{2}$ to $2\frac{3}{4}$ in length of head; interorbital space very narrow. Maxillary extending to below anterior margin of pupil or beyond; barbel about as long as diameter of eye, simple (females?) or with a terminal expansion (males?); 6 small, knob-like gill-rakers on lower part of anterior arch. Dorsal III 22–25. Anal 14–15. Last rays of dorsal and anal well separated from base of caudal. Pectoral with 16 or 17 rays, about $\frac{3}{4}$ length of head, extending to above anterior part of anal; pelvics shorter, just reaching vent. Caudal subtruncate or a little rounded. Yellowish-brown, becoming darker on hinder part of body; a dark patch on cheek below eye, and a dusky vertical bar across the operculum; spinous dorsal dusky; soft dorsal mainly dusky; anal black in its basal half, white distally; caudal white, with an incomplete oblique black bar across the base and a broader and more distinct oblique bar across its distal portion, the two being connected by black spots along the upper edge of the fin; pectorals with indistinct darker cross-bars, the lower rays more or less blackish; pelvics dusky in their basal parts.

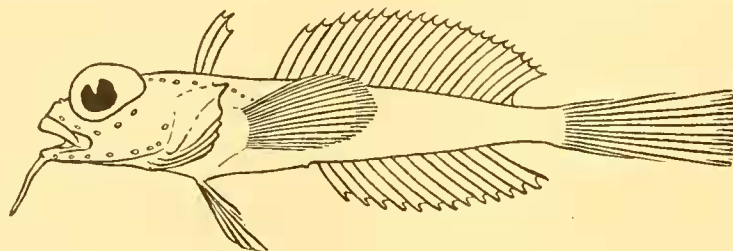


Fig. 28. *Dolloidraco longedorsalis*. $\times \frac{3}{4}$.

Hab. Graham Land; Queen Mary Land; South Victoria Land.

This species was originally described from 6 specimens, 72 to 89 mm. in length without the caudal fin, of which one is now in the British Museum collection, all from

Marguerite Bay, 230 metres¹. In all these specimens the barbel is simple. Of the 7 specimens, 100 to 137 mm. in total length, taken by the 'Aurora' at Queen Mary Land, 610 to 670 metres, some have a simple barbel, but in others this has a distal expansion. In the specimen obtained by the Discovery Committee, which I have ascertained is a female, the barbel is simple. Thus, it appears probable that this is a secondary sexual character as in *Artedidraco mirus*.

Genus HISTIODRACO

Histiodraco, Regan, 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped. 1910*, Zool. 1 (1), p. 9.
Type *Dolloidraco velifer*, Regan.

Differs from *Dolloidraco* in that the upper limb of the post-temporal projects as a prominent curved ridge.

A single species.

Coasts of the Antarctic Continent.

Histiodraco velifer (Regan).

Dolloidraco velifer, Regan, 1914, *Ann. Mag. Nat. Hist.*, (8) XIII, p. 12.

Histiodraco velifer, Regan, 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped. 1910*, Zool. 1 (1), p. 9, pl. v, fig. 3; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, 1, p. 74.

Depth of body 4 to $4\frac{1}{2}$ in the length, length of head $2\frac{1}{3}$ to $2\frac{2}{5}$. Diameter of eye $3\frac{1}{2}$ to $3\frac{3}{4}$, interorbital width about 12 in length of head. Maxillary extending to below middle of eye or beyond; lower jaw rather strongly projecting; barbel $\frac{2}{5}$ to more than $\frac{1}{2}$ length of head, fringed in its distal half; 7 very short, knob-like gill-rakers on lower part of anterior arch. Dorsal II–III, 26; spinous dorsal short and high; soft dorsal sometimes more or less elevated anteriorly, the highest rays $\frac{3}{5}$ to $\frac{9}{10}$ length of head. Anal 17. Pectoral with 18 or 19 rays, about $\frac{1}{2}$ length of head, longer than pelvics, which do not reach vent. Caudal truncate above, rounded below. Body marbled or irregularly barred with darker brown; fins more or less spotted; a dark bar at base of pectoral and another across the caudal.

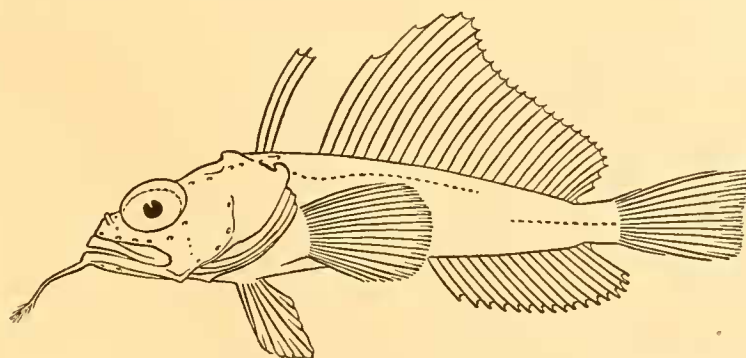


Fig. 29. *Histiodraco velifer*. $\times \frac{1}{2}$.

Hab. Mac-Robertson Land; South Victoria Land.

The types, 2 specimens 180 and 190 mm. in total length, are from the entrance to McMurdo Sound, $77^{\circ} 13' S$, $164^{\circ} 18' E$, at a depth of 385 metres. Two other examples

¹ I have seen 4 types in the Paris Museum (No. 13–187–190), 100 to 120 mm. in total length.

(150 and 170 mm.) from $66^{\circ} 45' S$, $62^{\circ} 03' E$, 219 metres, collected by the B.A.N.Z. Antarctic Research Expedition, are also included in this description.

Genus **POGONOPHRYNE**

Pogonophryne, Regan, 1914, *Ann. Mag. Nat. Hist.*, (8) xiii, p. 13; 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.* 1910, Zool. 1 (1), p. 9. Type *Pogonophryne scotti*, Regan.

Differs from *Histiodraco* in the wider interorbital region and the strongly depressed head, nearly as broad as long and much broader than deep; both lateral lines with tubules.

Two species.

Coasts of the Antarctic Continent and neighbouring islands.

***Pogonophryne scotti*, Regan.**

Pogonophryne scotti, Regan, 1914, *t.c.*, p. 13; 1914, *t.c.*, p. 9, pl. vi, fig. 1; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, iii (1), Fishes, p. 26.

St. 1660. 27. i. 36. $74^{\circ} 46' 4'' S$, $178^{\circ} 23' 4'' E$. Large otter trawl, 351 m.: 2 specimens, 240, 250 mm.

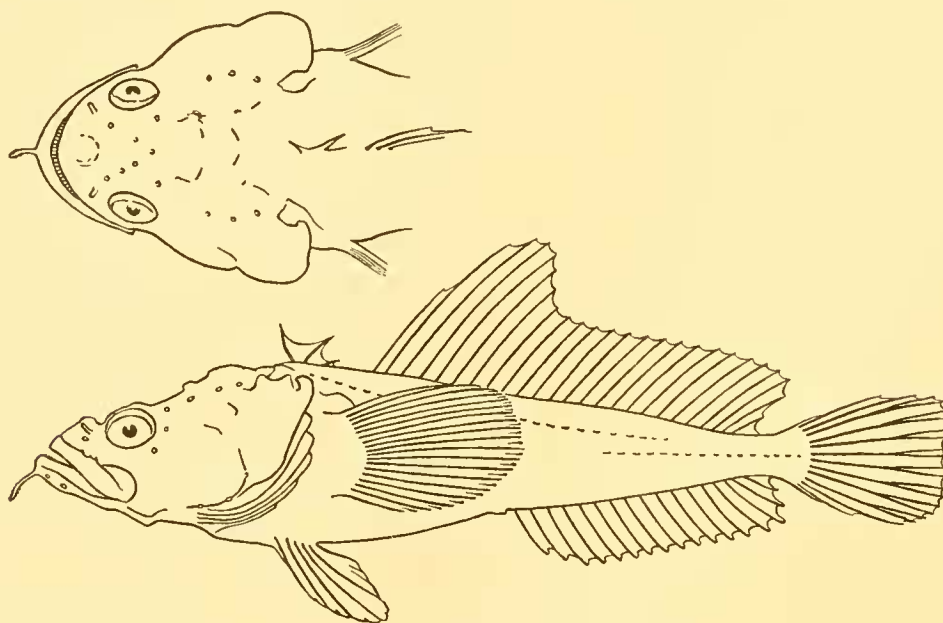


Fig. 30. *Pogonophryne scotti*. $\times \frac{1}{2}$.

Depth of body about 4 in the length, length of head $2\frac{1}{2}$ to $2\frac{4}{5}$. Head $1\frac{1}{4}$ to $1\frac{1}{3}$ times as long as broad. Diameter of eye $5\frac{1}{2}$ to $5\frac{3}{4}$, interorbital width about $4\frac{1}{2}$ in length of head. Maxillary extending to below middle of eye; lower jaw strongly projecting; barbel shorter than diameter of eye, blunt, papillose; 7 to 10 short, knob-like gill-rakers on lower part of anterior arch. Dorsal II-III, 25; spines low; anterior part of soft dorsal sometimes elevated. Anal 17-18. Pectoral with 19 rays, $\frac{1}{2}$ to $\frac{3}{5}$ length of head, extending to above origin of anal; pelvics short, rounded, not nearly reaching vent.

Caudal a little rounded. Body faintly spotted and marbled with darker; a more distinct dark blotch on either side of base of anterior part of soft dorsal; upper surface of head without markings; dorsals, caudal and pectorals with series of dark spots on the rays.

Hab. Queen Mary Land; South Victoria Land.

The type of the species, 290 mm. in total length, is from the Ross Sea, $74^{\circ} 25' S$, $179^{\circ} 3' E$, at a depth of 295 metres. The 'Aurora' obtained a single example, 240 mm. in length, from off Drygalski Island at a depth of 112 metres.

***Pogonophryne marmoratus*, sp.n.**

? *Artedidraco skottsbergi*, Lönnberg, 1905, *Wiss. Ergebn. Schwed. Südpol.-Exped.*, v (6), pl. ii, fig. 7.

St. 1948. 4. i. 37. $60^{\circ} 49' 4'' S$, $52^{\circ} 40' W$. Rectangular dredge, with Russell net, 490–610 m.: 1 male specimen, 175 mm. Holotype.

Closely related to *P. scotti*, but head about $1\frac{3}{5}$ times as long as broad; interorbital width more than 7 in length of head; barbel a little longer than diameter of eye, papillose, with terminal expansion. Dorsal II, 25. Anal 16. Upper surface and sides of head and body mottled and spotted with purplish brown; lower parts of body mainly blackish; soft dorsal and pectorals with series of dark spots, sometimes tending to form irregular bars; an irregular dark patch covering part of caudal; anal pale; inner rays of pelvics dusky.

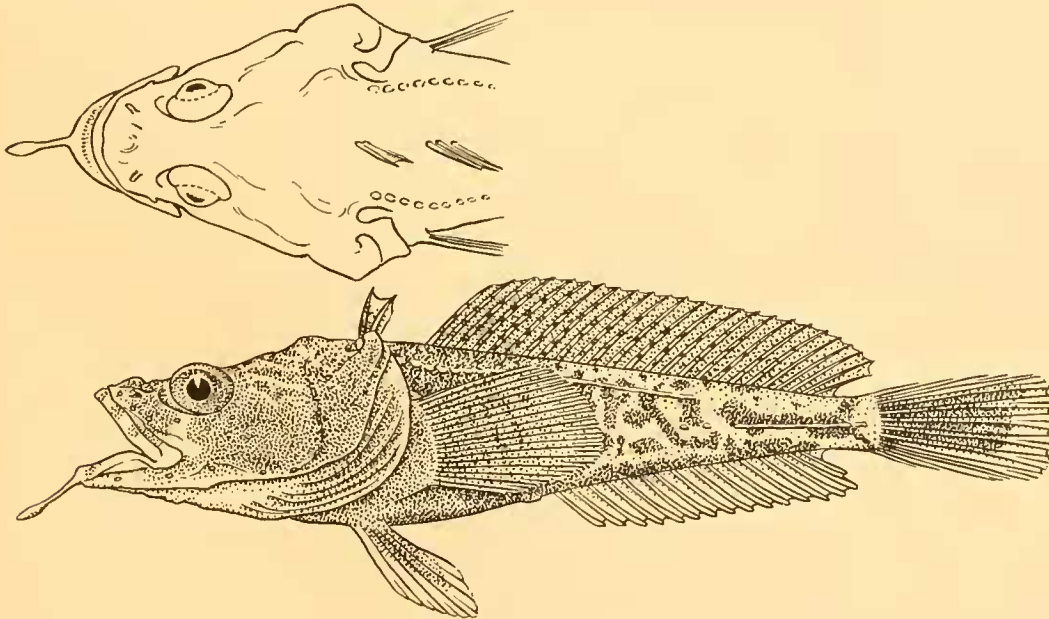


Fig. 31. *Pogonophryne marmoratus*. Holotype. $\times \frac{3}{4}$.

Hab. Near the South Shetland Islands.

Regan [1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.* 1910, Zool. 1 (1), p. 9] has suggested that the coloured drawing of a fish from the Bransfield Straits, 849 metres, reproduced by Lönnberg as *Artedidraco skottsbergi*, "seems rather to represent a

Pogonophryne", and it seems probable that the fish in question belonged to the species described above. The barbel is shown without a terminal expansion, but this may be due to the fact that the sketch was prepared in a hurry. Alternatively, the form of the barbel may differ in the sexes, as in *Artedidraco mirus*.

Genus HARPAGIFER

Harpagifer, Richardson, 1844, *Zool. 'Erebus' and 'Terror'* (Fish.), p. 11; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 94; Norman, 1937, *Discovery Rep.*, XVI, p. 94. Type *Batrachus bispinis*, Schneider.

A comparatively short upper lateral line with tubules; lower lateral line reduced to a series of pores; head rather broader than deep; snout about as long as eye; interorbital region of moderate width; post-temporal not prominent; operculum and suboperculum each forming a prominent spine. Mouth rather large; no mental barbel; teeth in villiform bands, without distinct canines. Spinous dorsal fin placed above the base of the pectoral.

A single species.

Patagonian region to Graham Land, Kerguelen and Macquarie Island.

Harpagifer bispinis (Schneider).

Batrachus bispinis, Schneider [ex Forster MS.], 1801, in Bloch, *Syst. Ichth.*, p. 45.

Callionymus bispinis, Forster, 1844, *Anim. Mar. Aust.*, p. 360.

Harpagifer bispinis, Richardson, 1844, *Zool. 'Erebus' and 'Terror'* (Fish.), pp. 11, 19, pl. vii, figs. 1-3, pl. xii, figs. 8, 9; Günther, 1860, *Cat. Fish.*, II, p. 263; Gill, 1876, *Bull. U.S. Nat. Mus.*, III, p. 41; Studer, 1879, *Arch. Naturg.*, XLV (1), p. 130; Günther, 1880, *Shore Fish. 'Challenger'*, p. 17; Fischer, 1885, *Jahrb. Hamburg. Wiss. Aust.*, II, p. 57; Vaillant, 1906, *Bull. Mus. Paris*, 1906, No. 3, p. 139; 1906, *Expéd. Antarct. Franç.* (1903-1905), Poiss., p. 45; Roule and Despax, 1911, *Bull. Mus. Paris*, 1911, No. 5, p. 279; Pappenheim, 1912, *Deutsche Südpol.-Expéd.*, XIII, Zool. v, p. 177, pl. ix, figs. 5a, 5b; Roule, Angel and Despax, 1913, *Deux. Expéd. Antarct. Franç.* (1908-1910), Poiss., p. 13; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 280; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 70; Norman, 1937, *Discovery Rep.*, XVI, p. 94, fig. 46; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Expéd.*, Ser. B, 1, pp. 59, 64.

Harpagifer palliolatus, Richardson, 1844, *t.c.*, p. 20, pl. xii, figs. 5-7.

St. MS 33. 1. v. 25. 1 cable E of Hobart Rock, East Cumberland Bay, South Georgia. Small beam trawl, 40 m.: 1 specimen, 65 mm.

St. WS 25. 17. xii. 26. Undine Harbour (North), South Georgia. Small beam trawl, 18-27 m.: 1 specimen, 37 mm.

St. 145. 7. i. 27. Stromness Harbour, South Georgia. Small beam trawl, 26-35 m.: 1 specimen, 95 mm.

Depth of body $3\frac{3}{4}$ to $4\frac{1}{2}$ in the length, length of head $2\frac{3}{4}$ to $3\frac{1}{4}$. Diameter of eye 4 to 5 in length of head, equal to or rather greater than interorbital width. Jaws equal anteriorly or lower a little projecting; maxillary extending to below middle or anterior part of eye; gill-rakers reduced to a few rudimentary knobs near angle of arch. Dorsal III-V, 21-26. Anal 16-21. Pectoral with 16 to 18 rays, more than $\frac{1}{2}$ as long as head, a little longer than pelvics, which do not reach the vent. Caudal rounded. Coloration

very variable; body usually with dark blotches or irregular cross-bars; fins mostly with small dark spots, often united to form narrow bars.

Hab. Graham Land; South Shetlands; South Orkneys; South Georgia; Straits of Magellan; Patagonia; Falkland Islands; Marion Islands; Crozets; Kerguelen; Macquarie Island.

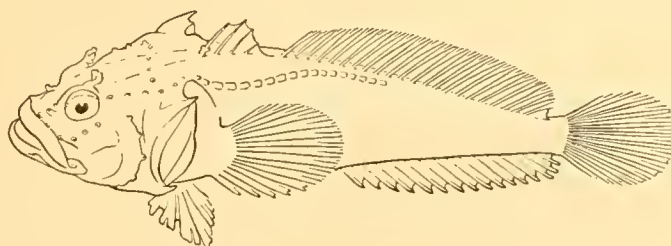


Fig. 32. *Harpagifer bispinis*. $\times 1$.

In addition to the specimens listed above, this description is based upon a large series of examples, up to 100 mm. in total length, in the British Museum collection, and a number of others in the collection of the B.A.N.Z. Antarctic Research Expedition. Schneider's *Batrachus bispinis* was based upon the MS. notes and drawing of Forster (MS IV, 45) of a specimen from the Straits of Magellan. The type of *Harpagifer palliolatus*, 70 mm. in total length, is from the Falkland Islands.

This is mainly a littoral species, occurring in tide pools and under rocks and stones; it is also found in the "kelp" in shallow water.

Family BATHYDRACONIDAE

Closely related to the Nototheniidae and Harpagiferidae, but with the head more or less depressed and the snout usually produced; mouth usually non-protractile; palatine elongate, without lateral ethmoid attachment; gill-membranes attached to the isthmus or forming a fold across it. No spinous dorsal fin.

Eight genera, all confined to the Antarctic Zone.

Key to the Genera

I. Body scaly or with serrated bony plates; snout spatulate; teeth villiform or cardiform, in bands, without canines.

A. Body without serrated bony plates; lateral line usually complete, but always extending at least as far as middle of dorsal.

1. A single lateral line, running to or towards middle of base of caudal fin.

1. *BATHYDRACO*.

2. Two or three lateral lines (at least in adult), the upper always present and running near base of dorsal fin.

a. Two lateral lines, a long upper one, and a short lower one placed above base of anal fin; snout narrow, more than twice as long as eye; dorsal with 45 to 47 rays, anterior part of fin not elevated; caudal emarginate

2. *GERLACHEA*.

- b. Three lateral lines (at least in adult), a long upper one, a short middle one on side of caudal peduncle, and a short lower one above base of posterior part of anal fin; snout broader, not more than $1\frac{1}{2}$ times as long as eye; dorsal with 30 to 37 rays, anterior part of fin forming a fairly distinct lobe; caudal rounded or subtruncate ... 3. *RACOVITZIA*.
- B. Body quadrangular, with a series of V-shaped, serrated bony plates at each angle, each plate with a backwardly directed spine; a single short lateral line, ending below anterior part of dorsal ... 4. *PRIONODRACO*.
- II. Body naked.
- A. Snout produced, spatulate; teeth in villiform bands, without canines; operculum with divergent ridges, ending in spinous points.
1. Upper lateral line ending below posterior part of dorsal; dorsal with 61 to 66 rays. 5. *CYGNODRACO*.
2. Upper lateral line extending beyond end of dorsal; dorsal with 42 to 46 rays. 6. *PARACHAENICHTHYS*.
- B. Snout not spatulate; canine teeth present in one or both of the jaws; operculum with a strong spine terminating in a hooked process.
1. Head and anterior part of body only slightly depressed; no canine teeth in lower jaw; mouth protractile; three lateral lines ... 7. *PSILODRACO*.
2. Head and anterior part of body distinctly depressed; strong canine teeth near symphysis of mandibles, exposed in front of snout; mouth not protractile; two lateral lines ... 8. *GYMNODRACO*.

Genus BATHYDRACO

Bathyraco, Günther, 1878, *Ann. Mag. Nat. Hist.*, (5) 11, p. 18; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 281. Type *Bathyraco antarcticus*, Günther.

Body scaly; a single lateral line, running to or towards middle of base of caudal. Snout produced, spatulate; jaws with bands of small villiform teeth. Operculum with upper edge concave, but without hooked branch posteriorly; gill-rakers well-developed and of moderate length; gill-membranes free from the isthmus, but slightly united anteriorly; 7 branchiostegals.

Five species.

Deep water near the coasts of the Antarctic Continent.

Key to the Species

- I. Depth 9 to 10 in length; eye $3\frac{3}{4}$ to 5 in head; dorsal 34-38, anal 29-31; sides of head more or less scaly.
- A. 11 to 16 gill-rakers on lower part of anterior arch; lateral line complete.
1. Only the upper half of operculum scaly; cheek completely scaled; 16 gill-rakers on lower part of anterior arch; about 140 scales in a longitudinal series. 1. *antarcticus*.
2. Operculum nearly completely scaly; cheek naked below suborbitals; 11 gill-rakers on lower part of anterior arch; about 125 scales in a longitudinal series. 2. *marri*.
3. A small patch of scales on upper part of operculum; cheek naked below suborbitals; 11 gill-rakers on lower part of anterior arch; about 90 scales in a longitudinal series ... 3. *macrolepis*.

- B. 19 to 22 gill-rakers on lower part of anterior arch; lateral line ending at some distance from caudal; a small patch of scales on upper part of operculum ... 4. *scotiae*.
- II. Depth $7\frac{1}{5}$ in length; eye $3\frac{1}{5}$ in head; dorsal 27, anal 22; sides of head naked; 17 gill-rakers on lower part of anterior arch ... 5. *nudiceps*.

Bathyraco antarcticus, Günther.

Bathyraco antarcticus, Günther, 1878, *Ann. Mag. Nat. Hist.*, (5) 11, p. 18; 1887, *Deep-Sea Fish. 'Challenger'*, p. 47, pl. viii, fig. A; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 282.

Depth of body 9 in the length, length of head 3. Snout $1\frac{1}{3}$ as long as eye, diameter of which is 4 in length of head; interorbital width 20. Lower jaw projecting; maxillary extending to vertical from anterior margin of eye; cheek completely scaled; only the upper half of the operculum scaly; 16 gill-rakers on lower part of anterior arch. About 140 scales in a lateral longitudinal series, about 60 in the lateral line, which is complete. Dorsal 36. Anal 31. Pectoral with 22 rays, truncated, as long as head without snout, extending to above origin of anal; pelvics much shorter, not nearly reaching vent. Caudal subtruncate. Pale brownish, the lower parts somewhat darker; caudal, anal, pelvics and lower parts of pectorals dusky.

Hab. South-east of Heard Island, 2300 metres.

Known only from the type of the species, 260 mm. in total length.

Bathyraco marri, sp.n.

St. 1658. 26. i. 36. $76^{\circ} 09.6' S$, $168^{\circ} 40' E$. Rectangular dredge, with Russell net, 520 m.: 1 specimen, 112 mm. Holotype.

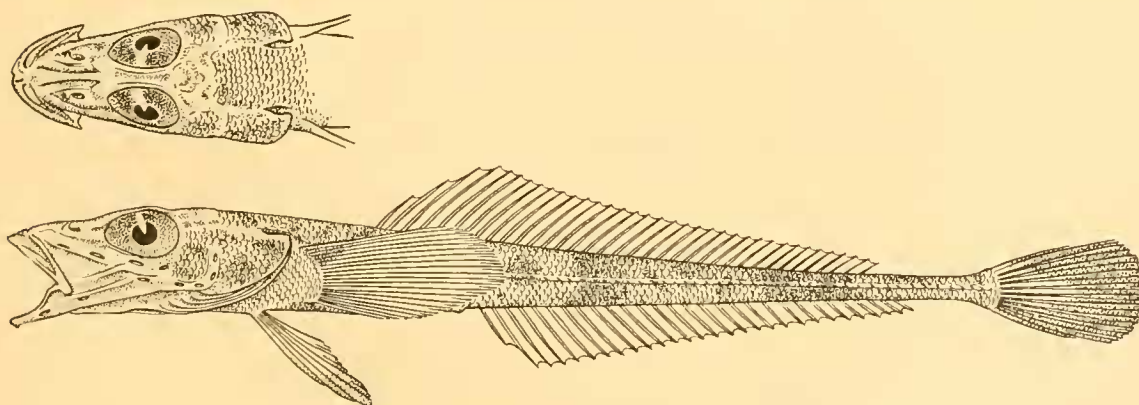


Fig. 33. *Bathyraco marri*. Holotype. $\times 1\frac{1}{2}$.

Depth of body about 9 in the length, length of head $3\frac{2}{5}$. Snout slightly longer than eye, diameter of which is $3\frac{3}{4}$ in length of head; interorbital width about 12. Lower jaw a little projecting; maxillary not reaching vertical from anterior margin of eye; cheek naked below the suborbitals, but a large patch of scales on the preoperculum and operculum; 11 gill-rakers on lower part of anterior arch. About 125 scales in a lateral longitudinal series, about 55 in the lateral line, which is complete. Dorsal 36. Anal 29. Pectoral with 22 rays, as long as head without snout, extending to a little beyond origin of anal; pelvics shorter, not reaching vent. Caudal a little rounded (?). Pale

yellowish-brown, with about 6 irregular dark patches on the back, of which 2 extend downwards on the sides and reach the anal fin; a number of irregular dark spots and blotches on sides of body and on the head; a dark longitudinal band near base of dorsal; caudal blackish, except at its base; a dusky patch on upper part of base of pectoral; pelvics a little dusky in their distal parts; anal pale.

Hab. Ross Sea.

This species is apparently most nearly related to *B. macrolepis*, Boulenger. I have much pleasure in naming it after Mr J. W. S. Marr, a member of the Discovery Committee's scientific staff.

***Bathydraco macrolepis*, Boulenger.**

Bathydraco macrolepis, Boulenger, 1907, *Nat. Antarct. Exped. Nat. Hist.*, 11, Fish., p. 4, pl. i, fig. 3; Regan, 1913, *t.c.*, p. 282.

Depth of body 9 in the length, length of head 3. Snout $1\frac{2}{5}$ as long as eye, diameter of which is $4\frac{1}{2}$ in length of head; interorbital width 14. Lower jaw projecting; maxillary reaching vertical from anterior margin of eye; cheek naked below the suborbitals; a small patch of scales on upper part of operculum; 11 gill-rakers on lower part of anterior arch. About 90 scales in a lateral longitudinal series, about 55 in the lateral line, which is complete. Dorsal 34. Anal 29. Pectoral with 23 rays, as long as head behind middle of eye, extending to above origin of anal; pelvics shorter, not reaching vent. Caudal subtruncate. Brownish; posterior part of caudal, distal parts of pelvics, and margin of anal more or less dusky.

Hab. South-west of Balleny Islands, 460 metres.

Known only from the type of the species, 210 mm. in total length.

***Bathydraco scotiae*, Dollo.**

Bathydraco scotiae, Dollo, 1906, *Proc. R. Soc. Edinburgh*, xxvi, p. 65; Regan, 1913, *t.c.*, p. 282, pl. ix, fig. 4; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, 1, p. 74.

Depth of body 9 to 10 in the length, length of head $3\frac{1}{6}$ to $3\frac{1}{4}$. Snout $1\frac{3}{4}$ as long as eye, diameter of which is about 5 in length of head; interorbital width 12 or 13. Lower jaw projecting; maxillary not reaching vertical from anterior margin of eye; cheek naked below the suborbitals; a small patch of scales on upper part of operculum; 19 to 22 gill-rakers on lower part of anterior arch. About 100 scales in a lateral longitudinal series, 36 to 43 in the lateral line, which ends at a distance from the caudal equal to $\frac{1}{4}$ or $\frac{1}{2}$ its own length. Dorsal 38–40. Anal 30–31. Pectoral with 22 or 23 rays, as long as head without snout, extending to above origin of anal or a little beyond; pelvics shorter, not reaching vent; caudal subtruncate. Pale brownish, the lower parts somewhat darker; caudal, anal, pectorals and pelvics more or less dusky.

Hab. Off Coats Land; off coast between Queen Mary Land and Wilkes Land.

The types of the species, 2 specimens 133 and 145 mm. in total length, were taken by the 'Scotia' off Coats Land ($71^{\circ} 22' S$, $16^{\circ} 34' W$), at a depth of 2645 metres. The

B.A.N.Z. Antarctic Research Expedition obtained a single specimen, 160 mm. long, from $64^{\circ} 21' S$, $116^{\circ} 02' E$, at a depth of 2260 metres.

Bathyraco nudiceps, Waite.

Bathyraco nudiceps, Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, 111 (1), Fishes, p. 27, pl. i, fig. 3, text-fig. 4.

Depth of body $7\frac{1}{5}$ in the length, length of head 3. Snout a little longer than eye, diameter of which is $3\frac{1}{5}$ in length of head; interorbital width 12. Lower jaw projecting; maxillary extending to below anterior margin of eye; head entirely naked; 17 gill-rakers on lower part of anterior arch. Body covered with cycloid scales; lateral line forming a low arch over the operculum, consisting of 5 or 6 large pores; a series of imperforate depressed scales forms a line from above the pectoral, thence along the middle of the side to the base of the caudal rays. Dorsal 27. Anal 22. Pectoral with 22 rays, extending to above the third anal ray; pelvics about as long, reaching vent. Caudal truncate. Pale brownish, the lower parts darker; dorsal fin pale, all other fins dark.

Hab. Off Queen Mary Land.

The type of the species, 144 mm. in total length, was from off Shackleton Ice-shelf ($65^{\circ} 20' S$, $95^{\circ} 27' E$), at a depth of 450 metres: the 'Aurora' obtained two other examples in the same neighbourhood at a depth of about 600 metres.

Genus **GERLACHEA**

Gerlachea, Dollo, 1900, *Bull. Acad. roy. Belg. (Classe Sci.)*, No. 3, p. 195; 1904, *Rés. Voy. 'Belgica'*, Zool., Poiss., p. 24; Regan, 1913, *t.c.*, p. 283. Type *Gerlachea australis*, Dollo.

Differs from *Bathyraco* in having two lateral lines, the long upper one running near the base of the dorsal fin, the short lower one above the anal fin. Snout narrow, more than twice as long as diameter of eye. Dorsal with 45 to 47 rays; anterior part of fin not elevated; caudal emarginate.

A single species.

Deep water off the coasts of the Antarctic Continent.

Gerlachea australis, Dollo.

Gerlachea australis, Dollo, 1900, *t.c.*, p. 196; 1904, *t.c.*, p. 25, pl. ii, fig. 1, pl. v, fig. 2; Roule and Despax, 1911, *Bull. Mus. Paris*, 1911, No. 5, p. 280; Roule, Angel and Despax, 1913, *Deux. Expéd. Antarct. Franç. (1908-1910)*, Poiss., p. 10, pl. i, fig. 1, pl. ii, figs. 1-2, pl. iii, fig. 5; Regan, 1913, *t.c.*, p. 283; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, 111 (1), Fishes, p. 29.

Depth of body $7\frac{1}{2}$ to more than 12 in the length, length of head $3\frac{1}{4}$ to nearly $3\frac{1}{2}$. Snout more than twice as long as eye, diameter of which is $4\frac{1}{5}$ to about $5\frac{1}{5}$ in length of head; interorbital width 11 to 14. Lower jaw projecting; maxillary not nearly reaching anterior margin of eye; cheek scaled; a patch of scales on upper part of operculum; gill-rakers represented by about 8 low dentigerous patches on the first arch. 85 scales in upper lateral line, which extends to below last ray of dorsal fin or a little beyond; length of lower lateral line variable. Dorsal 45-47. Anal 34-35. Pectoral

with 26 to 28 rays, $\frac{3}{5}$ to nearly $\frac{4}{5}$ length of head, extending to above vent or anterior rays of anal; pelvics much shorter, not nearly reaching vent. Caudal emarginate, its angles rounded. Yellowish brown; body with dark blotches or irregular cross-bars; a dark line from the snout to the eye, thence obliquely downwards across the opercles; all fins more or less dusky, except the anal, which is pale; distal parts of pelvics black.

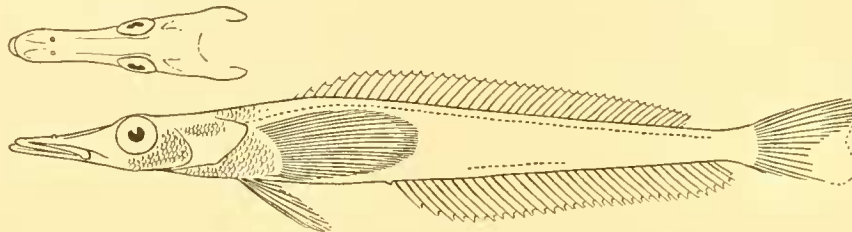


Fig. 34. *Gerlachea australis*. Holotype. $\times \frac{2}{3}$.

Hab. Graham Land; Charcot Land; Queen Mary Land: in deep water.

Through the courtesy of Dr V. Van Straelen, I have been able to examine the holotype of this species preserved in the Musée Royal d'Histoire Naturelle de Belgique. This is 180 mm. in total length and is in excellent condition. It was taken by the 'Belgica' at $71^{\circ} 14' S$, $89^{\circ} 14' W$, at a depth of 450 metres. The 'Pourquoi Pas?' obtained 4 examples¹ from $70^{\circ} 10' S$, $80^{\circ} 50' W$, at a depth of 450 metres, one of which (in a poor state of preservation) has been examined by me in the Paris Museum. The 'Aurora' obtained a single example, 208 mm. in length, from $64^{\circ} 44' S$, $97^{\circ} 28' E$, at a depth of 670 metres.

The extent to which the lower lateral line is developed seems to be somewhat variable. In the holotype it appears to be represented by about 18 scales on the left side, whereas, on the right side it is longer and is represented by at least 30 scales. Roule, Angel and Despax remark that in the specimens obtained by the 'Pourquoi Pas?' this lateral line is unequally developed on the two sides of the same fish, and Waite records the same condition in his example.

Three of the specimens taken by the 'Pourquoi Pas?' in January were mature females, and contained large eggs, varying in size from 2.5 to 3 mm.

Genus **RACOVITZIA**

Racovitzia, Dollo, 1900, *Bull. Acad. roy. Belg. (Classe Sci.)*, No. 3, p. 317. Type *Racovitzia glacialis*, Dollo.

Racovitzia, Dollo, 1904, *Rés. Voy. 'Belgica', Zool., Poiss.*, p. 28; Regan, 1913, *i.c.*, p. 283 [emend. pro *Racovitzia*].

Aconichthys, Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 30. Type *Aconichthys harrissoni*, Waite.

Related to *Bathydraco*, but with three lateral lines (except in the young), the upper always present and running near the base of the dorsal fin, the short middle one on the side of the caudal peduncle, and the short lower one above the base of the posterior

¹ One of these specimens has now been received in exchange from the Paris Museum: this is also in a very poor state of preservation.

part of the anal fin. Snout rather broad, spatulate, not more than $1\frac{1}{2}$ times as long as the eye. Dorsal with 30 to 37 rays, the anterior part of the fin forming a fairly distinct lobe; caudal rounded or subtruncate.

One or two species.

Coasts of Antarctic Continent.

Comparison of the unique type specimen of *Racovitzia glacialis*¹ with examples of *Aconichthys harrissoni* shows that the two fishes are almost certainly congeneric and may eventually prove to be identical. The body of *Racovitzia* was described by Dollo as having scattered groups of scales, but this character seems to be due to damage to the fish in capture. A specimen of *Aconichthys* (98 mm. in total length) shows a very similar condition, but a close examination of the skin reveals that many of the scales have become detached, leaving isolated groups on various parts of the body. In the type of *Racovitzia* only the upper lateral line is present, and this runs near the base of the dorsal fin. In a specimen of *Aconichthys*, 80 mm. in total length, the same condition is found, and the single lateral line ends below the posterior rays of the dorsal fin. In the specimen of 98 mm. mentioned above, this upper line extends a little beyond the end of the dorsal fin, and there is an indication of the middle line on the side of the caudal peduncle; there is, however, no trace of a lower lateral line. In all the larger examples of *Aconichthys* examined by me three lines are present, although in one example of 195 mm. on one side of the body the lower line is reduced to 2 or 3 scales, and in another of about the same size this line is present on one side of the body but entirely wanting on the other. I am unable to confirm the presence of the "incubatory pouch" between the pelvic fins and the vent described by Dollo, but am inclined to think that a post-mortem shrinkage in this region accompanied by folding of the skin may have produced the pouch-like condition.

Racovitzia glacialis, Dollo.

Racovitzia glacialis, Dollo, 1900, *t.c.*, p. 318.

Racovitzia glacialis, Dollo, 1904, *t.c.*, p. 29, pl. ii, figs. 2, 3, pl. v, fig. 3; Regan, 1913, *t.c.*, p. 283.

Depth of body 12 in the length, length of head $3\frac{1}{4}$. Snout longer than eye, about $2\frac{3}{4}$ in length of head; diameter of eye about $3\frac{3}{4}$, interorbital width 25. Lower jaw slightly projecting; maxillary not reaching vertical from anterior margin of eye. Dorsal 30. Anal 27. Pectoral with 25 rays, about $\frac{2}{3}$ length of head, extending as far as vent; pelvics shorter, not reaching vent. Body with dark spots and blotches forming very irregular cross-bars; an irregular black spot on anterior part of dorsal; anal pale; a black spot on upper edge of caudal; pectorals blackish at the base and with a black spot on upper edge; pelvics with a black spot distally.

¹ This specimen, which is 82 mm. in total length, is in very poor condition, the caudal fin being largely wanting and a portion of the caudal region of the body broken off. It is very difficult to handle the specimen or to make any close examination of it, for fear of causing further damage.

Hab. $71^{\circ} 19' S$, $87^{\circ} 37' W$; 435 metres.

Known only from the unique holotype, 82 mm. in total length, in the Musée Royal d'Histoire Naturelle de Belgique, Brussels. As pointed out above, I have re-examined this specimen, but, owing to the poor state of preservation, have been able to add very little to the original description.

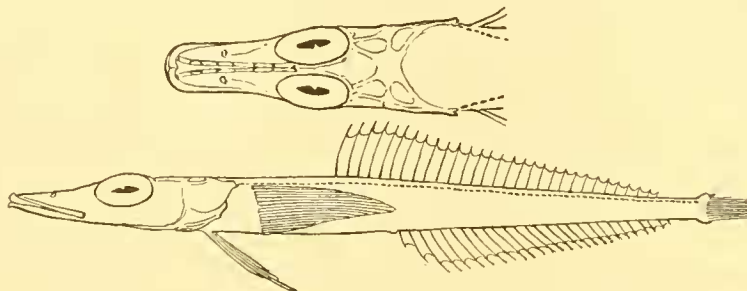


Fig. 35. *Racovitzia glacialis*. Holotype. $\times 1$. (After Dollo.)

Racovitzia harrissoni (Waite).

Aconichthys harrissoni, Waite, 1916, *t.c.*, p. 30, pl. ii, fig. 1, text-fig. 5; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, 1, p. 74.

St. 600. 17. i. 31. $67^{\circ} 09' S$, $69^{\circ} 27' W$. Large dredge, 487–512 m.: 1 specimen, 80 mm.

St. 1652. 23. i. 36. $75^{\circ} 56.2' S$, $178^{\circ} 35.5' E$. Rectangular dredge, with Russell net, 567 m.: 1 specimen, 293 mm.

Depth of body $7\frac{1}{2}$ to $9\frac{1}{2}$ in the length, length of head 3 to $3\frac{1}{3}$. Snout $1\frac{1}{3}$ to $1\frac{1}{2}$ times as long as eye, 3 to $3\frac{1}{5}$ in length of head; diameter of eye $3\frac{3}{4}$ to $4\frac{1}{4}$ in length of head; interorbital region very narrow. Lower jaw projecting; maxillary extending to or nearly to level of anterior margin of eye; a large patch of scales on the cheek and a small patch on upper part of operculum; 10 to 12 short gill-rakers on lower part of anterior arch. About 140 scales in a lateral longitudinal series; 82 to 91 in upper, 9 to 13 in middle, and 5 to 13 in lower lateral line (when this is present). Dorsal 34–37. Anal 28–31. Pectoral with 22 or 23 rays, about $\frac{3}{4}$ length of head, extending to above origin or anterior rays of anal; pelvics much shorter, not nearly reaching vent. Caudal rounded or subtruncate. Pale yellowish brown, spotted and variegated with darker; 6 black blotches on the back, the 4 below the dorsal fin most conspicuous and extending on to the fin; lower parts more or less dusky; dorsal fin with small dark spots on the rays, and sometimes with a dark blotch covering the posterior rays; anal fin pale or with a dusky longitudinal submarginal band, and with a white margin; caudal with its distal part dusky and its upper and lower edges black; always a distinct black spot on proximal part of upper edge; sometimes a narrow white posterior edge to the fin; pectoral usually with cross-bars; pelvics more or less dusky.

Hab. Off Graham Land; Mac-Robertson Land; Queen Mary Land; South Victoria Land.

This species was originally described from 5 specimens taken off Queen Mary Land at depths varying from 450 to 610 metres. The holotype was 278 mm. in total length.

In addition to the 2 specimens listed above, the description includes 4 examples (98 to 195 mm.) obtained by the B.A.N.Z. Antarctic Research Expedition.

It seems possible that this species will prove to be identical with *R. glacialis*, but, as described by Dollo, the latter has fewer dorsal and anal rays, a more slender body, and a rather longer snout. It may be noticed that the intense black spot on the upper edge of the caudal fin characteristic of this species is shown by Dollo in his figure of the type of *R. glacialis*.

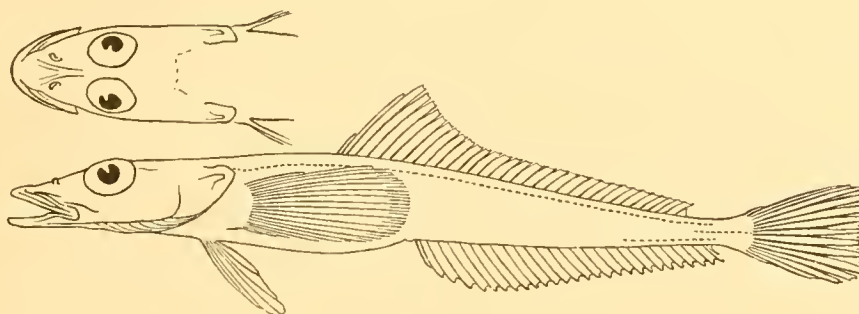


Fig. 36. *Racovitzia harrissoni*. $\times \frac{2}{3}$.

Genus PRIONODRACO

Prionodraco, Regan, 1914, *Ann. Mag. Nat. Hist.*, (8) XIII, p. 13; 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.* 1910, Zool. I (1), p. 10. Type *Prionodraco evansii*, Regan.

Body elongate, compressed, quadrangular, with a series of V-shaped, serrated, bony plates at each angle; each plate with a backwardly directed spine; lower series of plates ending in a group of nearly normal serrated scales behind pectoral fin; usually a series of similar scales along middle of side; body otherwise naked. Lateral line single, incomplete. Snout spatulate; mouth slightly protractile; teeth small, villiform, in bands. Operculum hooked upwards posteriorly, its upper edge deeply concave; gill-membranes narrowly united to the isthmus anteriorly. Vertebrae 50 (16+34).

A single species.

Coasts of the Antarctic Continent.

Prionodraco evansii, Regan.

Prionodraco evansii, Regan, 1914, *t.c.*, p. 13; 1914, *t.c.*, p. 10, pl. vii, fig. 1; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 35; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, 1, p. 75.

St. 167. 20. ii. 27. Off Signy Island, South Orkneys. Net (7 mm. mesh) attached to back of trawl, 244-344 m.: 30 specimens, 65-162 mm.

Depth of body 7 to 8 in the length, length of head 3 to $3\frac{2}{3}$. Snout as long as or a little longer than eye, diameter of which is 3 to $3\frac{1}{2}$ in length of head; interorbital width 14 to 16. Lower jaw a little projecting; maxillary extending to or nearly to level of anterior margin of eye; cheeks and opercles entirely naked; 15 to 18 gill-rakers on lower part of anterior arch. About 50 plates in the upper series; 12 to 17 tubular scales in

lateral line, which ends below anterior part of dorsal fin. Dorsal 34-38. Anal 29-33. Pectoral with 21 or 22 rays, $\frac{2}{3}$ to $\frac{3}{4}$ length of head, extending to above anterior rays of anal; pelvics shorter, not reaching vent. Caudal rounded or subtruncate. Head and body with numerous dark spots; usually a well-defined lateral series of large oblong or squarish spots; a deep black spot on base of anterior part of dorsal fin and sometimes 2 or 3 smaller spots more posteriorly; some small spots on the rays of the dorsal fin; caudal and pectorals with spots or irregular cross-bars; anal generally with a dark longitudinal band along its margin, becoming narrower posteriorly, the rays tipped with white; pelvics pale or more or less dusky.

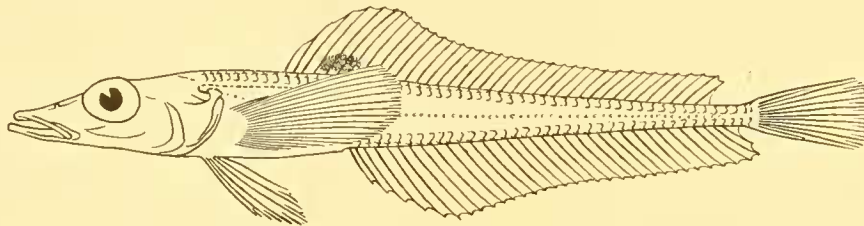


Fig. 37. *Prionodraco evansii*. $\times \frac{3}{4}$.

Hab. South Orkneys; Mac-Robertson Land; Queen Mary Land; South Victoria Land.

The types of the species, 11 specimens, measuring up to 132 mm. in total length, are from the Ross Sea ($74^{\circ} 25' S$, $179^{\circ} 3' E$), 290 metres; and the entrance to McMurdo Sound ($76^{\circ} 56' S$, $164^{\circ} 12' E$ and $77^{\circ} 13' S$, $164^{\circ} 18' E$), 300 and 380 metres. In addition to the types and the examples obtained by the Discovery Committee, the above description includes a number of specimens, up to 145 mm. in total length, collected by the B.A.N.Z. Antarctic Research Expedition.

Genus **CYGNODRACO**

Cygnodraco, Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, 111 (1), Fishes, p. 32. Type *Cygnodraco mawsoni*, Waite.

Body elongate, compressed, naked; two lateral lines, the upper terminating below posterior part of dorsal fin, the lower represented by a broken series of depressed, non-perforate scales, running along middle of hinder part of body. Head scarcely depressed; snout produced, spatulate; interorbital region narrow; jaws with bands of small, villiform teeth. Operculum with upper edge concave, armed with divergent ridges ending in spinous points; gill-rakers represented by very small, flat, dentigerous knobs; gill-membranes free from the isthmus but slightly united anteriorly. Dorsal with 61 to 66 rays; anal with 35 to 38 rays. Pelvics rather long and narrow, as long as or longer than the pectorals.

A single species.

Coasts of the Antarctic Continent.

Cygnodraco mawsoni, Waite.

Cygnodraco mawsoni, Waite, 1916, *t.c.*, p. 33, pl. iii, fig. 1, text-fig. 6; Norman, 1937, *t.c.*, p. 75.

Depth of body $7\frac{3}{4}$ to nearly 10 in the length, length of head $2\frac{3}{4}$ to 3. Snout nearly $\frac{1}{2}$ length of head; diameter of eye $5\frac{1}{4}$ (young) to nearly 6, interorbital width 31 to 33 in length of head. Lower jaw a little projecting; maxillary not nearly reaching vertical from anterior margin of eye; 14 or 15 gill-rakers on lower part of anterior arch. About 110 scales in the upper lateral line, which follows the dorsal profile. Dorsal 61–66. Anal 35–38. Pectoral with 22 or 23 rays, length 2 to $2\frac{1}{3}$ in that of head, not nearly reaching vent; pelvics as long as or longer than pectorals (much longer in young), not reaching vent. Caudal rounded. Yellowish or greyish-brown; traces of a dark line on each side of the snout, a dark spot below the eye, and a dark bar running backwards from the eye towards the suboperculum; body with about 7 rather indistinct dark cross-bars on the back and upper parts of the sides; dorsal, anal and caudal more or less dusky, at least in adults, the dorsal with two narrow longitudinal dark stripes running for the whole length of the fin; pectorals and pelvics pale.

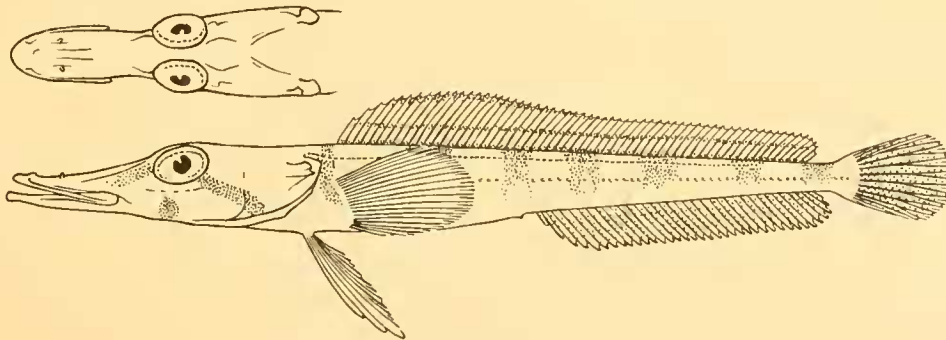


Fig. 38. *Cygnodraco mawsoni*. $\times \frac{1}{3}$.

Hab. Mac-Robertson Land; Queen Mary Land.

The type of the species, 466 mm. in total length, was taken off Drygalski Island ($65^{\circ} 42' S$, $92^{\circ} 10' E$), at a depth of 112 metres. The above description is based mainly upon 6 specimens, 125 to 360 mm. in total length, obtained by the B.A.N.Z. Antarctic Research Expedition, at a depth of 219 metres.

Genus **PARACHAENICHTHYS**

Parachaenichthys, Boulenger, 1902, *Rep. Coll. Nat. Hist. 'Southern Cross'*, p. 176. Type *Chaenichthys georgianus*, Fischer.

Very closely related to *Cygnodraco*, but with the head and anterior part of the body more or less depressed and the interorbital region broader. The upper lateral line extends beyond the end of the dorsal fin. Dorsal with 42 to 46 rays; anal with 30 to 33 rays. Pelvics broader, generally a little shorter than pectorals.

Two species.

Graham Land and neighbouring islands; South Georgia.

Parachaenichthys georgianus (Fischer).

Chaenichthys georgianus, Fischer, 1885, *Jahrb. Hamburg. Wiss. Aust.*, 11, p. 50, pl. i, figs. 1-2.

Parachaenichthys georgianus, Boulenger, 1902, *t.c.*, p. 176; Lönnberg, 1905, *Wiss. Ergebn.*

Schwed. Südpol.-Exped., v (6), p. 36; 1906, *K. Svensk. Vet.-Akad. Handl.*, XL (5), p. 95;

Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 287.

St. MS 32. 1. v. 25. East Cumberland Bay, South Georgia. Small beam trawl, 40 m.: 2 specimens, 84, 185 mm.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia. Large otter trawl, 179-235 m.: 8 specimens, 260-470 mm.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 120-204 m.: 2 specimens, 83, 92 mm.

St. 45. 6. iv. 26. 2.7 miles S 85° E of Jason Light, South Georgia. Large otter trawl, 270-238 m.: 4 specimens, 280-480 mm.; large otter trawl, 238-270 m.: 1 specimen, 82 mm.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia. Large otter trawl, 122-136 m.: 1 specimen, 160 mm.

St. —. 6. i. 27. Stromness Harbour, South Georgia. Hand line, 9-10 m.: 1 specimen, 455 mm.

St. 148. 9. i. 27. Off Cape Saunders, South Georgia. Larger otter trawl, 132-148 m.: 1 specimen, 170 mm.

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia. Large otter trawl, 200-234 m.: 4 specimens, 175-435 mm.

St. WS 62. 19. i. 27. Wilson Harbour, South Georgia. Small beam trawl, 26-83 m.: 11 specimens, 65-115 mm.

St. WS 65. 22. i. 27. Undine Harbour (North), South Georgia. Hand line, 5 m.: 2 specimens, 450, 475 mm.

St. —. Nov. 1930. 1 specimen, 133 mm., taken from stomach of *Chaenocephalus aceratus*.

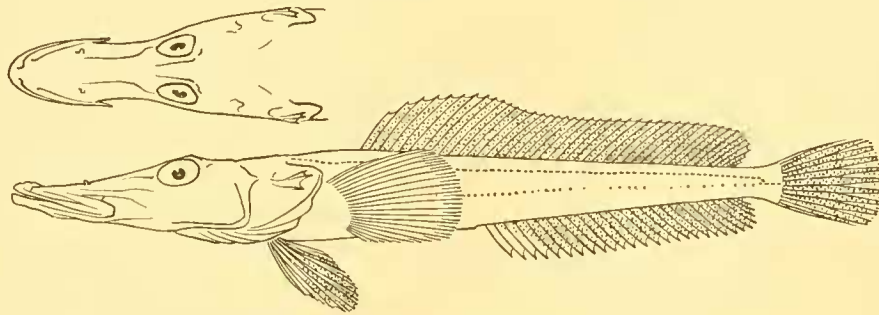


Fig. 39. *Parachaenichthys georgianus*. $\times \frac{1}{4}$.

Depth of body 7 to 10 in the length, length of head $2\frac{1}{2}$ to nearly 3. Snout nearly $\frac{1}{2}$ length of head; diameter of eye 5 (young) to $7\frac{1}{2}$, interorbital width 13 to 17 in length of head. Lower jaw a little projecting; maxillary not nearly reaching vertical from anterior margin of eye; operculum with 3 radiating ridges terminating in spinous points; 16 to 19 gill-rakers on lower part of anterior arch. 102 to 110 tubular scales in upper lateral line, which extends beyond last ray of dorsal fin and joins the lower lateral line on the caudal peduncle; this part of the lower lateral line with 4 to 9 tubular scales, in front of which is an irregular series of depressed non-perforate scales. Dorsal 43-46. Anal 31-33. Pectoral with 21 to 23 rays, length 2 to $2\frac{1}{3}$ in that of head, not or scarcely reaching vent; pelvics a little shorter, not reaching vent in adult. Caudal rounded or

subtruncate. Yellowish-brown, spotted and variegated with darker, the markings being more distinct in young and half-grown specimens; dorsal pale in young, with series of spots on the rays forming two longitudinal dark stripes, becoming more or less dusky posteriorly; in half-grown and adult specimens the whole dorsal fin is dusky, with a narrow white margin; anal pale anteriorly, dusky posteriorly (young), or wholly dusky or blackish, the rays sometimes tipped with white (adult); caudal dusky or blackish; pectorals pale; pelvics blackish on the membrane between the inner rays.

Hab. South Georgia.

This species was described by Fischer from a specimen 490 mm. in total length. He mentions 2 whole specimens and 4 heads in the Zoological Museum at Hamburg (Nos. 3916, 3855).

***Parachaenichthys charcoti* (Vaillant).**

Chaenichthys charcoti, Vaillant, 1906, *Bull. Mus. Paris*, 1906, No. 5, p. 247; 1906, *Expéd. Antarct. Franç.* (1903-1905), Poiss., p. 39, text-fig. 1.

St. 1873. 13. xi. 36. 61° 20.8' S, 54° 04.2' W. Rectangular dredge, with Russell net, 200-137 m.: 1 specimen, 290 mm.

Close to the preceding species, but with a somewhat shorter snout, and the inter-orbital width about $1\frac{1}{2}$ in length of head. Maxillary extending to or nearly to level of anterior margin of eye; operculum with 5 or 6 radiating ridges ending in spinous points, the uppermost with an antrorse hook; 13 gill-rakers on lower part of anterior arch. 114 tubular scales in upper lateral line; no tubular scales in lower lateral line, which is represented by a series of depressed, non-perforate scales running along middle of hinder part of body. Dorsal 42. Anal 30. Pectoral with about 21 rays. Yellowish-brown; head and anterior part of body with numerous small dark spots and rings; hinder part of body with incomplete and irregular dark cross-bars; dorsal and anal plain, the latter with a pale margin; caudal blackish, with a narrow pale hinder edge; small dark spots at bases of pectorals; pelvics dusky.

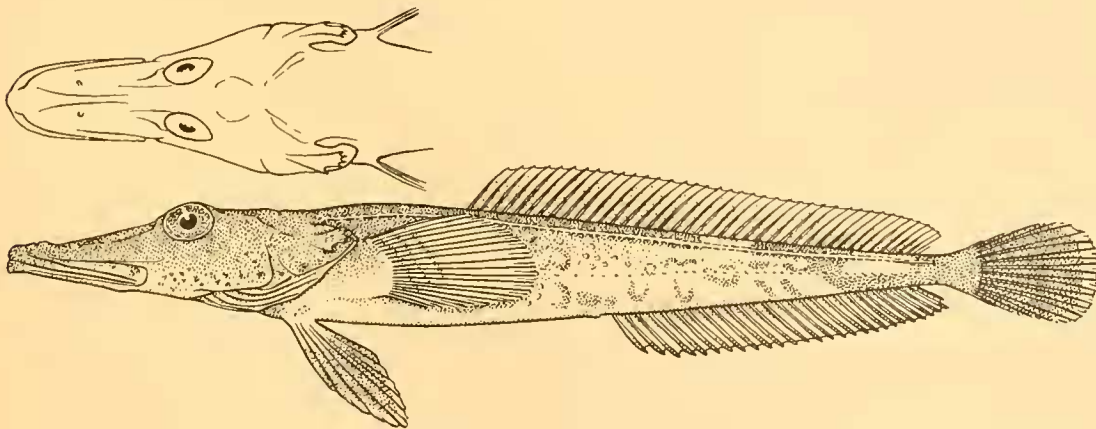


Fig. 40. *Parachaenichthys charcoti*. $\times \frac{1}{2}$.

Hab. Graham Land and neighbouring islands.

The type of this species consists of a head, 145 mm. in length (measured to tips of opercular spines), and a portion of the tail-end of the body, the latter very poorly preserved, in the Paris Museum (No. 06—144). As the jaws and opercles of this specimen are fully expanded, as shown in Vaillant's figure, the general appearance of the head appears at first sight unlike that of a *Parachaenichthys*. I have carefully examined the type, however, and have little doubt that it belongs to the same species as the much smaller fish obtained by the 'Discovery II'. The type is from Booth Wandel Island, at a depth of 30 metres.

Genus **PSILODRACO**

Psilodraco, Norman, 1937, *Ann. Mag. Nat. Hist.*, (10) xx, p. 475. Type *Psilodraco breviceps*, Norman.

Body naked, subcylindrical anteriorly, compressed posteriorly; three lateral lines, consisting of series of imperforate scales more or less embedded in the skin. Head not much depressed; snout not produced, bluntly pointed; mouth moderately protractile; a band of villiform teeth in the upper jaw; each praemaxillary with a group of canine teeth anteriorly; teeth in lower jaw in several rows anteriorly, becoming uniserial laterally. Gill-membranes forming a fold across the isthmus; 6 branchiostegals; gill-rakers reduced to a few vestiges near the angles of the arches; operculum with a fairly strong spine with a hooked branch; suboperculum without spine. No spinous dorsal fin. Pelvic fins short, with the middle rays longest. Vertebrae 48 (16+32).

A single species.

South Georgia.

This genus is clearly related to *Gymnodraco*, and examination of a skeleton prepared for me by Mr W. R. Sherrin reveals no important osteological differences. *Psilodraco* differs from *Gymnodraco* mainly in the shape of the head and body, the form of the jaws and teeth, and in the presence of three lateral lines.

***Psilodraco breviceps*, Norman.**

Psilodraco breviceps, Norman, 1937, *t.c.*, p. 476.

St. MS 68. 2. iii. 26. East Cumberland Bay, South Georgia. Large rectangular net, 220–247 m.: 1 specimen, 128 mm.

St. MS 71. 9. iii. 26. East Cumberland Bay, South Georgia. Small beam trawl, 110–60 m.: 1 specimen, 36 mm.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia. Large otter trawl, 179–235 m.: 22 specimens, 36–195 mm. (holotype, 190 mm.).

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 120–204 m.: 12 specimens, 48–137 mm.

St. 45. 6. iv. 26. 2.7 miles S 85° E of Jason Light, South Georgia. Large otter trawl, 238–270 m.: 22 specimens, 90–180 mm.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 230–250 m.: 6 specimens, 70–115 mm.

St. 142. 30. xii. 26. East Cumberland Bay, South Georgia. Large otter trawl, 88–273 m.: 3 specimens, 137–185 mm.

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia. Large otter trawl, 200–234 m.: 2 specimens, 123, 145 mm.

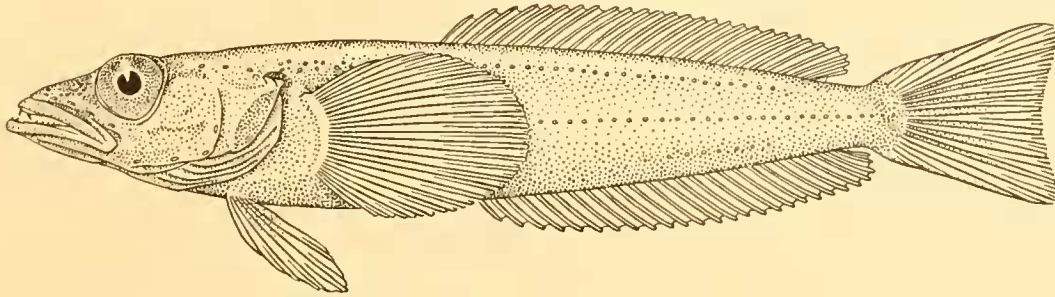


Fig. 41. *Psilodraco breviceps*. Holotype. $\times \frac{3}{4}$.

Depth of body $4\frac{3}{4}$ to $5\frac{1}{2}$ in the length, length of head about 3. Snout about as long as eye, diameter of which is 3 to nearly 4 in length of head; interorbital width 8. Lower jaw projecting; maxillary extending to below anterior $\frac{1}{2}$ or middle of eye. Upper lateral line extending to below last rays of dorsal or not as far; middle lateral line extending forward to level of middle or posterior part of pectoral; lower lateral line of varying length, running parallel with the base of the anal fin. Dorsal 27–30. Anal 27–29. Pectoral with 25 to 27 rays, nearly as long as head, extending to above anterior part of anal; pelvics much shorter, not reaching vent. Brownish above, more or less silvery on sides and beneath, without any definite markings, but with the silvery parts speckled with close-set dark dots; distal part of snout and tip of lower jaw usually darker; fins usually all pale, the caudal and occasionally the other fins sometimes a little dusky.

Hab. South Georgia.

Genus GYMNODRACO

Gymnodraco, Boulenger, 1902, *Rep. Coll. Nat. Hist. 'Southern Cross'*, p. 186; Regan, 1913, *t.c.*, p. 283.

Related to *Psilodraco*, but with the body depressed anteriorly, compressed posteriorly. Two lateral lines. Head depressed; snout produced, pointed; mouth non-protractile; jaws with curved compressed teeth, close-set in a single series and with large anterior canines, those of the mandible exposed in front of the snout. Operculum with a strong spine with a hooked branch; suboperculum with a short spine. Vertebrae 48 (20 + 28).

A single species.

Coasts of the Antarctic Continent.

Gymnodraco acuticeps, Boulenger.

Gymnodraco acuticeps, Boulenger, 1902, *t.c.*, p. 186, pl. xvii; Pappenheim, 1912, *Deutsche Südpol.-Expd.*, xiii, Zool. v, p. 176, pl. ix, fig. 4; Regan, 1913, *t.c.*, p. 284.

Depth of body 8 in the length, length of head about 3. Snout as long as postorbital part of head; diameter of eye 5 to 6 in length of head, interorbital width 6 to 7. Lower

jaw strongly projecting; maxillary extending to below anterior margin of eye. Upper lateral line extending from the gill-opening to about the vertical of the origin of the dorsal, lower lateral line from below the extremity of the upper to the base of the caudal fin, running along the middle of the caudal region. Dorsal 28-30. Anal (22) 24-26. Pectoral with 21 or 22 rays, truncated, $\frac{1}{2}$ as long as head; pelvics much shorter, not nearly reaching vent. Caudal truncate. Brownish-olive, the lower parts whitish; large dark spots on head and body; fins dusky.

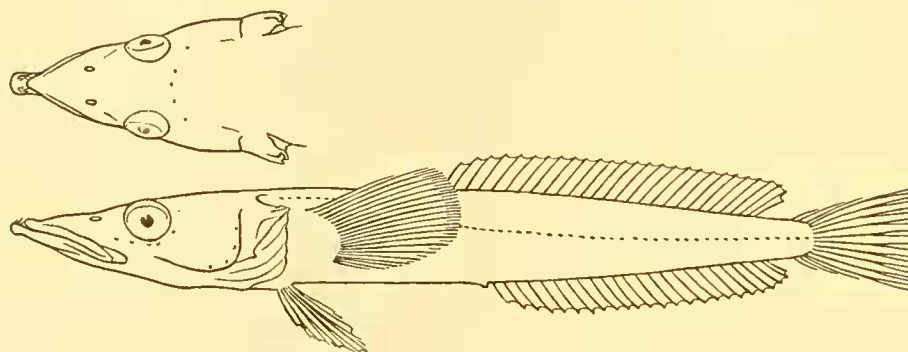


Fig. 42. *Gymnodraco acuticeps*. $\times \frac{1}{2}$.

Hab. Wilhelm Land; South Victoria Land.

The types of the species, 5 specimens up to 300 mm. in total length, are from Cape Adare, 7 to 14 metres: two of these (200 and 300 mm.) are in the collection of the British Museum. The 'Gauss' obtained a further example, 200 mm. long, from the Winter Quarters of the expedition in Wilhelm Land.

Family CHAENICHTHYIDAE

Body naked. Snout produced and depressed, spatulate. Mouth non-protractile; palatine in great part ligamentous; pterygoid slender; no mesopterygoid. Gill-membranes very narrowly united to isthmus or forming a fold across it; operculum usually with radiating ridges ending in simple or branched spines. Spinous dorsal fin present. Ribs not ossified.

Nine genera, all of which occur in, and eight of which are confined to, the Antarctic Zone.

Key to the Genera

- I. Middle rays of pelvic fin longest.
 - A. Lateral line without bony plates.
 1. Spinous dorsal of 8 to 15 spines; operculum with at least 3 spines.
 - a. Two lateral lines (upper and middle); dorsal fins subcontinuous.
 - α. Dorsal IX-X, 32-40; anal 31-39; no rostral spine; gill-rakers short, but well-developed 1. *CHAMPSOCEPHALUS*.
 - β. Dorsal (IX) XII-XV, 26-31; anal 24-27; a rostral spine; gill-rakers vestigial or absent 2. *PAGETOPSIS*.

- Genus CHAMPSOCEPHALUS

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 230-250 m.: 5 specimens, 220-270 mm.

St. 140. Stromness Harbour to Larsen Point, South Georgia. Large otter trawl, 122–136 m.: 1 specimen, 155 mm.

Depth of body 6 to $7\frac{1}{5}$ in the length, length of head $3\frac{1}{5}$ to $3\frac{1}{2}$. Snout about as long as postorbital part of head; diameter of eye $4\frac{1}{5}$ to $5\frac{1}{5}$, interorbital width $3\frac{1}{2}$ to $4\frac{1}{2}$ in length of head. Maxillary extending to below anterior $\frac{1}{4}$ or $\frac{1}{5}$ of eye; upper and middle opercular spines only free distally, appearing as a single bifid (sometimes trifid) spine. Dorsal IX–X, 37–40. Anal 36–39. Pectoral with 25 to 27 rays, about $\frac{3}{4}$ length of head, extending to above anterior rays of anal; pelvics about $\frac{3}{8}$ length of head. Yellowish-brown or plumbeous, with a series of darker cross-bars; dorsal and anal fins usually more or less blackish; other fins pale or dusky.

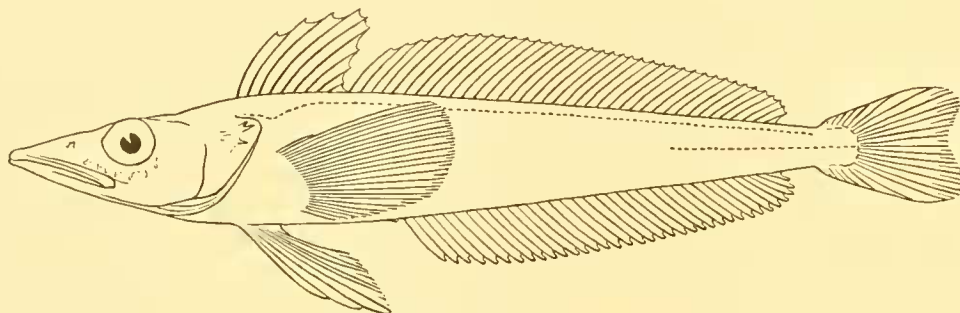


Fig. 43. *Champsocephalus gunnari*. $\times \frac{1}{2}$.

Hab. South Georgia; Kerguelen.

This species was originally described from 9 specimens, 322 to 436 mm. in total length, all from Cumberland Bay, South Georgia, 75 to 195 metres. *C. gunnari* may be readily distinguished from the Patagonian *C. esox* by the deeper body, rather shorter head, larger eye, shorter maxillary, form of the opercular spines; and higher number of dorsal and anal rays, as well as by the difference in coloration. Recently, the B.A.N.Z. Antarctic Research Expedition obtained 2 examples (235 and 300 mm.) of this species from Kerguelen at a depth of 91 metres, as well as remains of other specimens from the stomachs of fishes and penguins.

Genus PAGETOPSIS

Pagetopsis, Regan, 1913, *t.c.*, p. 286. Type *Champsocephalus macropterus*, Boulenger.

Body naked, moderately elongate; two lateral lines, without bony plates. An antrorse curved rostral spine; eye behind middle of length of head. Teeth in jaws small, sharp, biserial; lower jaw slightly projecting; gill-rakers vestigial or absent; operculum armed with 3 or 4 radiating ridges terminating in spinous points, the uppermost with an antrorse hook. Spinous dorsal well developed, its base more than $\frac{1}{2}$ that of soft dorsal; pelvics rather long, the rays bifid or slightly branched.

A single species.

Coasts of Antarctic Continent.

Pagetopsis macropterus (Boulenger).

Champscephalus macropterus, Boulenger, 1907, *Nat. Antarct. Exped. Nat. Hist.*, 11, Fish., p. 3, pl. ii; Pappenheim, 1912, *Deutsche Südpol.-Exped.*, XIII, Zool. v, p. 174; Roule, Angel and Despax, 1913, *Deux. Expéd. Antarct. Franç.* (1908-1910), Poiss., p. 13.

Pagetopsis macropterus, Regan, 1913, *t.c.*, p. 286; 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.* 1910, Zool. 1 (1), p. 11; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 37, fig. 8; Norman, 1937, *t.c.*, p. 76.

St. 1660. 27. i. 36. $74^{\circ} 46.4' S$, $178^{\circ} 23.4' E$. Large otter trawl, 351 m.: 3 specimens, 185-235 mm.

Depth of body 4 to $5\frac{3}{5}$ in the length, length of head $2\frac{3}{5}$ to $2\frac{4}{5}$. Snout nearly $\frac{1}{2}$ length of head; diameter of eye about 5, interorbital width 4 to more than $4\frac{1}{2}$ in length of head. Maxillary extending to below anterior $\frac{1}{4}$ or $\frac{1}{3}$ of eye. Dorsal (IX) XII-XV, (26) 27-31. Anal 24-27. Pectoral with 22 or 23 rays, $\frac{1}{2}$ to $\frac{3}{5}$ length of head, extending to above vent or origin of anal; pelvics a little longer, reaching vent or not quite as far. Caudal subtruncate or a little rounded. Dark spots and vermiculations on head; irregular double cross-bars on body; spinous dorsal more or less blackish, the spines tipped with white; soft dorsal dusky; anal and caudal mostly pale; pectorals pale; pelvics blackish.

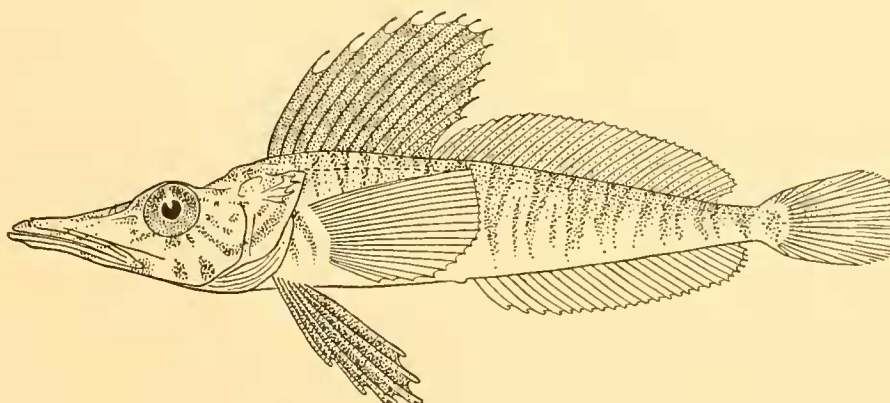


Fig. 44. *Pagetopsis macropterus*. $\times \frac{1}{2}$.

Hab. Graham Land; Enderby Land; Mac-Robertson Land; Wilhelm Land; Queen Mary Land; Adelie Land; South Victoria Land.

This species was originally described from 11 specimens, 65 to 240 mm. long, obtained from the stomach of a Weddell Seal near Cape Armitage, Ross Island: of these, 6 examples (160 to 250 mm.) are in the collection of the British Museum.

Genus PSEUDOCHAENICHTHYS

Pseudochaenichthys, Norman, 1937, *Ann. Mag. Nat. Hist.*, (10) xx, p. 476. Type *Pseudochaenichthys georgianus*, Norman.

Body naked, moderately elongate; three lateral lines, without bony plates. An antrorse curved rostral spine; eye a little behind middle of length of head. Jaws with bands of small, curved, sharp teeth; lower jaw projecting; gill-rakers very short, knob-

like, dentigerous; operculum with a group of 4 or 5 spines, the uppermost with an antrorse hook. Spinous dorsal well developed, its base not more than $\frac{1}{2}$ that of soft dorsal, from which it is separated by an interspace; pelvics rather long, with the rays normally branched, the middle ones the longest.

A single species.

South Georgia.

Pseudochaenichthys georgianus, Norman.

Pseudochaenichthys georgianus, Norman, 1937, *t.c.*, p. 476.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia. Large otter trawl, 179–235 m.: 2 specimens, 285, 350 mm.

St. 45. 6. iv. 26. 2·7 miles S 85° E of Jason Light, South Georgia. Large otter trawl, 270–238 m.: 4 specimens, 350–480 mm. (holotype, 480 mm.).

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 230–250 m.: 6 specimens, 155–175 mm.

St. 142. 30. xii. 26. East Cumberland Bay, South Georgia. Large otter trawl, 88–273 m.: 1 specimen, 153 mm.

St. 148. 9. i. 27. Off Cape Saunders, South Georgia. Large otter trawl, 132–148 m.: 3 specimens, 430–465 mm.

Depth of body $4\frac{1}{2}$ to nearly 6 in the length, length of head $2\frac{1}{3}$ to $2\frac{1}{2}$. Snout nearly $\frac{1}{2}$ length of head; diameter of eye 5 (young) to 7, interorbital width rather more than 4 in length of head. Supraorbital edges roughened (except in young), but only slightly raised; upper surface of head not rugose; maxillary extending to below middle of eye; about 18 gill-rakers on lower part of anterior arch. Dorsal VIII–X, 29–31; sixth or seventh spine longest. Anal 28–31. Pectoral with 23 or 24 rays, $\frac{1}{2}$ to $\frac{3}{8}$ length of head, extending to above origin or anterior rays of anal; pelvics as long as or rather longer than pectorals. Caudal subtruncate or a little rounded. Brownish, the upper parts of the body irregularly marked with darker in the young, but these markings tend to disappear in the adults, which are nearly uniformly coloured; spinous dorsal and pelvics blackish; other fins pale or a little dusky.

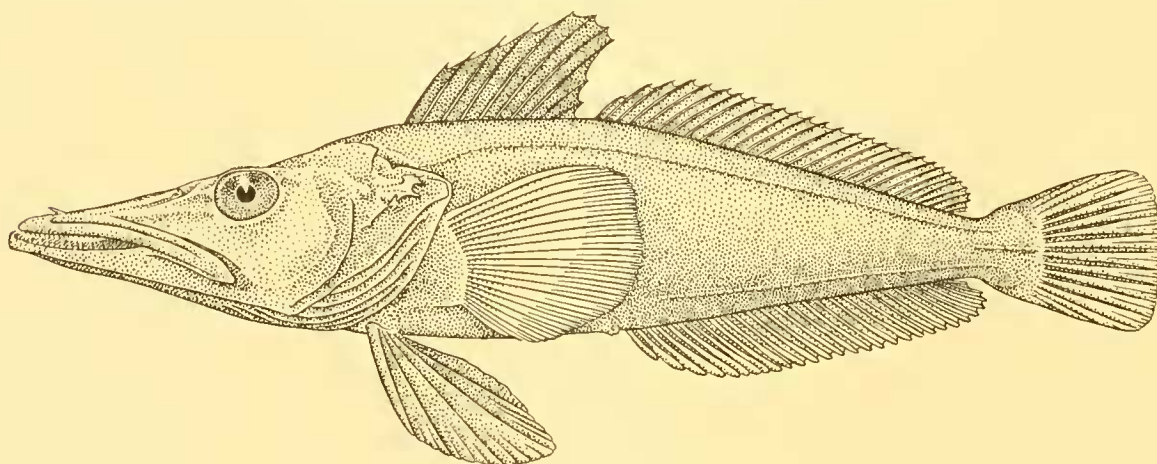


Fig. 45. *Pseudochaenichthys georgianus*. Holotype. $\times \frac{1}{3}$.

Hab. South Georgia.

Genus DACODRACO

Dacodraco, Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, 111 (1), Fishes, p. 35. Type *Dacodraco hunteri*, Waite.

Body naked, moderately elongate; two lateral lines (an upper and a lower), without bony plates. No rostral spine; eye behind middle of length of head. Jaws each with a single row of small teeth, with an inner series of large spaced canines; lower jaw slightly projecting; no gill-rakers; operculum with a single broad, flat spine. Spinous dorsal with only 3 spines, well separated from soft dorsal; pelvics of moderate length, with the rays normally branched, the middle ones the longest.

A single species.

Coasts of the Antarctic Continent.

Dacodraco hunteri, Waite.

Dacodraco hunteri, Waite, 1916, *t.c.*, p. 36, pl. ii, fig. 2, text-fig. 7.

? *Pagetodes antarcticus* (part), Pappenheim, 1912, *Deutsche Südpol.-Exped.*, xiii, Zool. v, p. 175.

Depth of body $6\frac{2}{5}$ in the length, length of head $2\frac{3}{5}$. Snout about $\frac{1}{2}$ the length of the head; diameter of eye $4\frac{1}{2}$, interorbital width $5\frac{4}{5}$ in length of head. Maxillary extending to below middle of eye. Upper lateral line originating above the angle of the operculum, rising to below the interdorsal space, and following the profile to the base of the caudal; lower lateral line commencing above the twelfth ray of the anal and running near to the ventral profile to the base of the caudal. Dorsal III, 32; spines subequal, low, as long as diameter of eye, not higher than the rays of the soft dorsal. Anal 29. Pectoral with 24 rays, extending to above the sixth ray of the anal; pelvics about as long as pectorals, just reaching the anal. Caudal truncate. Reddish brown, with 7 darker cross-bars on body, the first two of which are slightly oblique; spinous dorsal black; other fins dusky, the pectorals being black proximally and the pelvics distally.

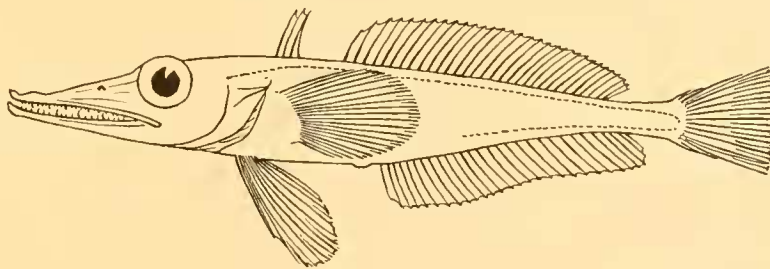


Fig. 46. *Dacodraco hunteri*. Holotype. $\times \frac{1}{2}$. (After Waite.)

Hab. Wilhelm Land (?); Queen Mary Land, 610 metres.

Known only from 2 specimens, both obtained by the 'Aurora' off Shackleton Ice-shelf ($65^{\circ} 6' S$, $96^{\circ} 13' E$). The type was 211 mm. in total length.

The specimen of 69 mm., identified by Pappenheim as *Pagetodes antarcticus*, from the Winter Station of the 'Gauss', may belong here.

Genus **CHAENICHTHYS**

Channichthys, Richardson, 1844, *Ann. Mag. Nat. Hist.*, XIII (June), p. 461. Type *Channichthys rhinocerus*, Richardson.

Chaenichthys, Richardson, 1844, *Zool. 'Erebus' and 'Terror'*, (Fish.), p. 12 (*emend. pro Channichthys*).

Chaenichthys, Günther, 1860, *Cat. Fish.*, II, p. 249; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 286 (*emend. pro Chaenichthys*).

Related to *Champsocephalus*, but there is a rostral spine, the teeth are in broader bands, and the lateral line is provided with bony plates. Gill-rakers short, dentigerous. Dorsal fins well separated.

Two species.

Kerguelen.

***Chaenichthys rhinocerus*, Richardson.**

Channichthys rhinocerus, Richardson, 1844, *Ann. Mag. Nat. Hist.*, XIII (June), p. 461.

Chaenichthys rhinocerus, Richardson, 1844, *Zool. 'Erebus' and 'Terror'*, (Fish.), p. 12, pl. vi, figs. 1-3; Gill, 1876, *Bull. U.S. Nat. Mus.*, III, p. 41.

Chaenichthys rhinocerus (part), Günther, 1860, *Cat. Fish.*, II, p. 249.

Chaemethys rhinocerus, Studer, 1879, *Arch. Naturg.*, XLV (1), p. 131.

Chaenichthys rhinocerus, Günther, 1880, *Shore Fish. 'Challenger'*, p. 16; Pappenheim, 1912, *Deutsche Südpol.-Exped.*, XIII, *Zool.* v, p. 173; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 286; Monod and Dollfus, 1932, *Bull. Soc. Zool. Fr.*, LVII, p. 74; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, I, p. 65.

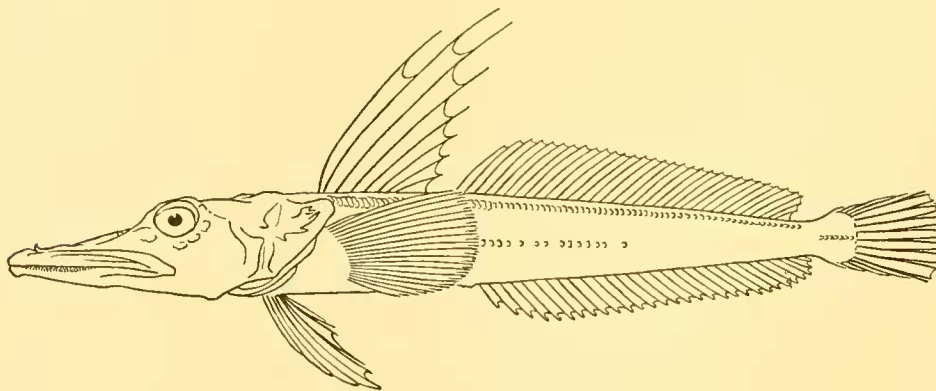


Fig. 47. *Chaenichthys rhinocerus*. $\times \frac{1}{3}$.

Depth of body $5\frac{1}{2}$ to more than 7 in the length, length of head $2\frac{2}{5}$ to nearly $2\frac{3}{4}$. Diameter of eye $5\frac{1}{2}$ to $7\frac{1}{4}$, interorbital width 5 to $6\frac{1}{2}$ in length of head. Maxillary extending to below middle of eye or beyond in adults. Head moderately or rather strongly rugose, the supraorbital edges usually not much raised. 69 to 84 plates in upper lateral line; a few plates on middle of side. Dorsal VII-VIII, 32-34; second and third spines longest, thence decreasing rapidly in length. Anal 30-33. Pectoral with 19 to 22 rays, extending to above vent or origin of anal; pelvics as long as or a little longer than pectorals, not reaching vent. Caudal rounded. Brownish, with darker spots and reticulations; spinous dorsal blackish; other fins pale or dusky.

Hab. Kerguelen.

The type of the species, 450 mm. in total length, was taken in the kelp close to the shore, the fish being caught with the hook. In addition to this specimen, and a smaller one (175 mm.) collected by the 'Challenger', several examples (300 to 510 mm.) collected by the B.A.N.Z. Antarctic Research Expedition are included in the above description.

***Chaenichthys rugosus*, Regan.**

Chaenichthys rhinocerus (part), Günther, 1860, *t.c.*, p. 249.

Chaenichthys rhinocerus (*non* Richardson), Günther, 1879, *Phil. Trans. R. Soc. London*, CLXVIII (extra vol.), p. 166.

Chaenichthys rugosus, Regan, 1913, *t.c.*, p. 287; Norman, 1937, *t.c.*, p. 66.

Very closely related to *C. rhinocerus*, but diameter of eye $7\frac{1}{4}$ to 8 in length of head; maxillary extending to or nearly to below middle of eye. Head rougher and supra-orbital edges more elevated. 62 or 63 plates in upper lateral line; a nearly continuous series of plates on middle of side. Dorsal VIII, 30–31; third and fourth spines longest, fifth about as long as first. Anal 28–29. Pectoral with 18 rays, scarcely extending to above vent; pelvics longer. Nearly uniformly brownish.

Hab. Kerguelen.

The type of the species, 400 mm. in total length, has the head and body much distorted. The B.A.N.Z. Antarctic Research Expedition obtained a second example, 245 mm. in total length, which has been included in the above description. A stuffed specimen in the British Museum collection may also belong to this species.

Genus CHAENOCEPHALUS

Chaenocephalus, Regan, 1913, *t.c.*, p. 287. Type *Chaenichthys aceratus*, Lönnberg.

Body naked, elongate; two lateral lines, without distinct bony plates. A small prominence at anterior end of ethmoid; eye somewhat behind middle of head. Jaws with small sharp teeth forming rather broad bands, there being several series even at the sides; lower jaw not projecting; gill-rakers absent except for 3 or 4 very short ones below the angle of the first arch; operculum with 3 or 4 radiating ridges ending in spines, the uppermost with two or more points. Spinous dorsal well developed, its base about $\frac{1}{4}$ that of the soft dorsal, from which it is separated by an interspace; pelvics comparatively short, with the two outer rays the longest, enveloped in thick skin, but bifid, the others normally branched.

A single species.

Palmer Archipelago; South Orkneys; South Georgia.

***Chaenocephalus aceratus* (Lönnberg).**

Chaenichthys aceratus, Lönnberg, 1906, *K. Svensk. Vet.-Akad. Handl.*, XL (5), p. 97.

Chaenocephalus aceratus, Regan, 1913, *t.c.*, p. 288, pl. xi.

St. MS 68. 3. ii. 26. East Cumberland Bay, South Georgia. Large rectangular net, 220–247 m.: 1 specimen, 515 mm.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia. Large otter trawl, 179–235 m.: 5 specimens, 255–420 mm.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 120–204 m.: 2 specimens, 255, 290 mm.

St. 45. 6. iv. 26. 2.7 miles S 85° E of Jason Light, South Georgia. Large otter trawl, 270–238 m.: 1 specimen, 495 mm., with cranium of another.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 230–250 m.: 5 specimens, 147–160 mm.

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia. Large otter trawl, 200–234 m.: 8 specimens, 135–160 mm.

St. 167. 20. ii. 27. Off Signy Island, South Orkneys. Net (7 mm. mesh) attached to back of trawl, 244–344 m.: 1 specimen, 210 mm.

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago. Large otter trawl, 160–335 m.: 1 specimen, 580 mm.

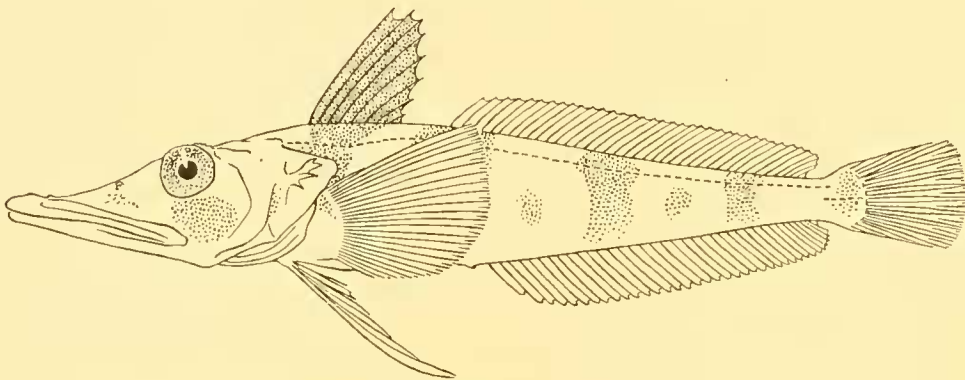


Fig. 48. *Chaenocephalus aceratus*. $\times \frac{1}{3}$.

Depth of body 5 to 7 in the length, length of head $2\frac{1}{2}$ to $2\frac{4}{5}$. Snout a little less than $\frac{1}{2}$ length of head; diameter of eye about equal to interorbital width, and 5 to 6 in length of head. Maxillary extending to below middle of eye or beyond (not so far in young). Supraorbital edges raised and more or less roughened. Dorsal VII–VIII, 38–40. Anal 37–39. Pectoral with 25 or 26 rays, $\frac{2}{5}$ to $\frac{2}{3}$ length of head, extending to above origin or anterior rays of anal; pelvics in young longer than head and reaching to beyond middle of anal, in adult much shorter, subequal to pectorals, not reaching vent. Caudal a little rounded. Greyish or pale brownish, with 4 or 5 dark cross-bars, the first from spinous dorsal to base of pectoral, the second downwards from origin of soft dorsal, the others less regular and sometimes with narrower bars developed between them; spinous dorsal blackish or dusky; other fins more or less pale.

Hab. Palmer Archipelago; South Orkneys; South Georgia.

The type of this species was 522 mm. in total length, and was caught in Cumberland Bay at a depth of about 5 to 7 metres.

Genus **CRYODRACO**

? *Pagetodes*, Richardson, 1844, *Zool. 'Erebus' and 'Terror' (Fish.)*, p. 15. (No type.)

Cryodraco, Dollo, 1900, *Bull. Acad. roy. Belg. (Classe Sci.)*, No. 2, p. 129; Regan, 1913, *t.c.*, p. 288. Type *Cryodraco antarcticus*, Dollo.

Related to *Chaenocephalus*, but the rays of the pelvic fins are simple, the two outer ones enlarged and prolonged; an additional lateral line at the base of the anal fin.

Two species.

Coasts of the Antarctic Continent.

Cryodraco antarcticus, Dollo.

? *Pagetodes*, Richardson, 1844, *Zool. 'Erebus' and 'Terror'* (Fish.), p. 15, pl. viii, fig. 3.

Cryodraco antarcticus, Dollo, 1900, *Bull. Acad. roy. Belg. (Classe Sci.)*, No. 2, p. 129; 1904, *Rés. Voy. 'Belgica'*, Zool., Poiss., p. 20, pl. i, pl. v, fig. 7; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 288; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 39; Norman, 1937, *t.c.*, p. 76.

Cryodraco atkinsoni, Regan, 1914, *Ann. Mag. Nat. Hist.*, (8) XLIII, p. 13; 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.* 1910, Zool. I (1), p. 11, pl. vii, fig. 2.

St. 167. 20. ii. 27. Off Signy Island, South Orkneys. Net (7 mm. mesh) attached to back of trawl, 244–344 m.: 2 specimens, 220, 230 mm.

St. 1660. 27. i. 36. 74° 46' 4" S, 178° 23' 4" E. Large otter trawl, 351 m.: 2 specimens, 245, 250 mm.

Depth of body $7\frac{1}{2}$ to $8\frac{1}{4}$ in the length, length of head $3\frac{1}{8}$ to $3\frac{1}{3}$. Snout $\frac{1}{2}$ or nearly $\frac{1}{2}$ length of head; diameter of eye 4 to $5\frac{1}{5}$, interorbital width $4\frac{2}{3}$ to more than 5 in length of head. Lower jaw not projecting; maxillary extending nearly to below middle of eye. Supraorbital edges not raised; operculum with two divergent ridges, each ending in a spine, the upper one being bi- or tri-fid. Dorsal III–V, 40–44; the membrane between the spines sometimes missing (? torn away) in young; first and second spines subequal or first a little longer than second. Anal 42–46. Pectoral with 23 to 25 rays, about $\frac{3}{8}$ length of head, extending to above anterior rays of anal; pelvics from $\frac{3}{4}$ (adult) to twice (young) length of head, extending in adults to below middle of dorsal fin or not as far, in young nearly to end of dorsal. Caudal a little emarginate. Greyish or pale brownish, with dark spots on head and with 6 or 7 dark cross-bars on body, sometimes incomplete and sometimes with irregular bars or blotches between them; spinous dorsal blackish; pelvics and distal part of caudal dusky; other fins pale.

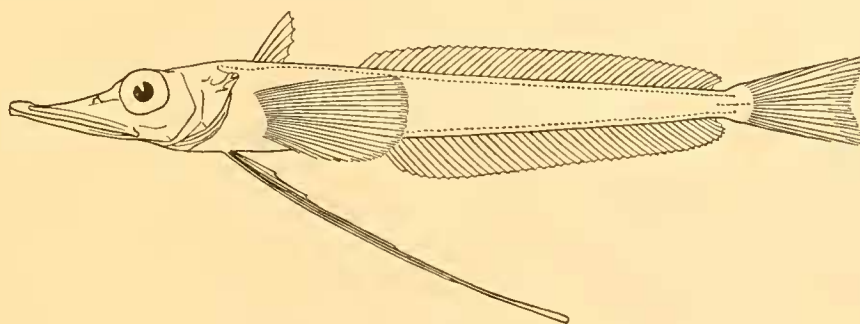


Fig. 49. *Cryodraco antarcticus*. $\times \frac{1}{2}$.

Hab. Graham Land; South Orkneys; Mac-Robertson Land; Queen Mary Land; South Victoria Land.

The type of the species, 200 mm. in total length, was from 71° 18' S, 88° 2' W, at a depth of 450 metres. The type of *C. atkinsoni*, 293 mm. in total length, is from the

Ross Sea ($74^{\circ} 25' S$, $179^{\circ} 3' E$), at a depth of 296 metres. I have elsewhere given reasons for following Waite in regarding these species as identical.

The name *Pagetodes* was given by Richardson, without trivial name, to a fish 160 mm. in total length, which was "thrown up by the spray in a gale of wind, against the bows of the 'Terror, and frozen there", at $77^{\circ} 10' S$, $178\frac{1}{2}^{\circ} W$. The specimen was unfortunately appropriated by the ship's cat before a description or detailed drawing could be made. The rough sketch published by Richardson depicts a fish not unlike a *Cryodraco*, but, as Regan has pointed out, in some characters it shows more resemblance to *Pagetopsis*. The name *Pagetodes* should, therefore, be eliminated.

Cryodraco pappenheimi, Regan.

Pagetodes antarcticus (non Dollo), Pappenheim, 1912, *Deutsche Südpol.-Exped.*, XIII, Zool. v, p. 175.
Cryodraco pappenheimi, Regan, 1913, *t.c.*, p. 289.

Closely related to *C. antarcticus*, but length of head $2\frac{3}{5}$ in the length of the fish. Snout $\frac{1}{2}$ length of head; diameter of eye 5, interorbital width 4 in length of head. Dorsal V, 45. Anal 39. Pelvics reaching fourteenth ray of dorsal (the prolonged rays perhaps not entire).

Hab. Wilhelm Land.

The type of the species, 168 mm. in length to base of caudal, was obtained from the stomach of a seal at the Winter Station of the 'Gauss'.

Genus CHIONODRACO

Chionodraco, Lönnberg, 1906, *K. Svensk. Vet.-Akad. Handl.*, XL (5), p. 99; Regan, 1913, *t.c.*, p. 288; 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.* 1910, Zool. I (1), p. 12. Type *Chaenichthys rhinoceratus hamatus*, Lönnberg.

Body naked, elongate; three lateral lines, without bony plates. A rostral spine; eye somewhat behind middle of head; supraorbital ridges crenulated. Teeth bi- or tri-serial; gill-rakers absent except for a few vestiges near the angles of the arches; operculum with a group of 3 to 5 spines, the uppermost with 2 to 4 points; sub- and inter-operculum bearing a pair of spines just behind angle of preoperculum. Spinous dorsal well-developed, of five to seven spines; pelvics comparatively short, of a spine and five branched or bifid rays, the two outer the longest and (in adult) enveloped in thick skin. Skeleton essentially similar to that of *Champsocephalus*. Vertebrae 64.

Two species.

Coasts of the Antarctic Continent.

Chionodraco kathleenae, Regan.

Chionodraco kathleenae, Regan, 1914, *Ann. Mag. Nat. Hist.*, (8) XIII, p. 13; 1914, *Rep. Brit. Antarct. ('Terra Nova') Exped.* 1910, Zool. I (1), p. 12, pl. viii; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 41; Norman, 1937, *t.c.*, p. 77, figs. 7 B, 9.

St. 1658. 26. i. 36. $76^{\circ} 09' 6'' S$, $168^{\circ} 40' E$. Rectangular dredge, with Russell net, 520 m.: 1 specimen, 270 mm.

Depth of body 5 to $6\frac{1}{4}$ in the length, length of head $2\frac{3}{5}$ to 3. Snout a little less than $\frac{1}{2}$ length of head; diameter of eye $4\frac{3}{4}$ to $6\frac{1}{4}$, interorbital width $3\frac{1}{2}$ to about 4 in length

of head. Rostral spine erect or retrorse. Jaws equal anteriorly or lower jaw projecting; maxillary extending to below anterior part or middle of eye. Dorsal V–VII, 38–45 (51); third or fourth spines generally longest; spinous dorsal separated from soft dorsal by an interspace which varies from less than $\frac{1}{4}$ to about $\frac{3}{4}$ of the length of the base of the former. Anal (33) 34–38. Pectoral with 22 to 24 rays, $\frac{1}{2}$ to nearly $\frac{3}{5}$ length of head, extending to above vent or anterior rays of anal; pelvics I 5, $\frac{1}{2}$ to $\frac{4}{5}$ length of head, reaching vent, origin of, or anterior rays of anal in young, not reaching vent in adult. Caudal subtruncate or rounded. Pale brownish or greyish; head and body with dark spots and bars; spinous dorsal blackish; other fins pale or more or less dusky.

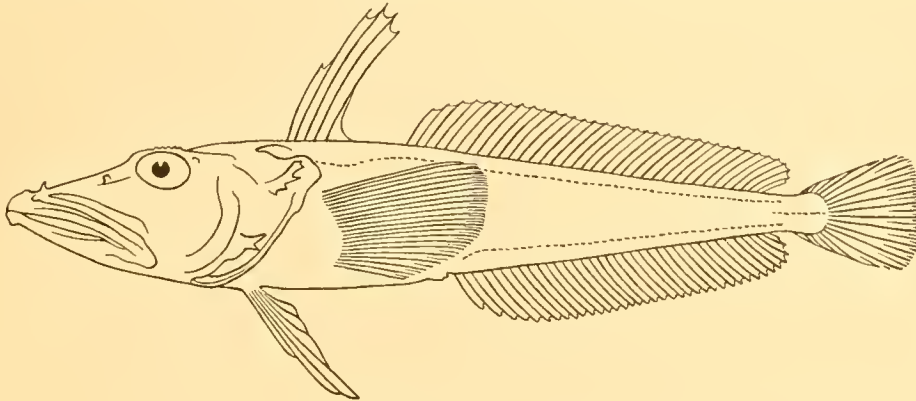


Fig. 50. *Chionodraco kathleenae*. $\times \frac{1}{4}$.

Hab. Mac-Robertson Land; Queen Mary Land; South Victoria Land.

The types of the species, 250 to 500 mm. in total length, are from the Ross Sea ($74^{\circ} 25' S$, $179^{\circ} 3' E$), 296 metres, and McMurdo Sound, 187 to 375 metres. The B.A.N.Z. Antarctic Research Expedition obtained 16 examples, 275 to 470 mm. in total length, from off Mac-Robertson Land at a depth of 219 metres: these specimens have been included in the description of the species. Two young specimens (70 and 71 mm.) were collected by the same expedition with mid-water nets hauled obliquely from 169 metres to the surface. The eye is proportionately smaller in these young specimens, the diameter being nearly 6 in the length of the head, the pelvic fin-rays are simple, and the pelvic fins themselves are blackish in their distal parts.

***Chionodraco hamatus* (Lönnberg).**

Chaenichthys rhinoceratus subsp. *hamatus*, Lönnberg, 1905, *Wiss. Ergebn. Schwed. Südpol.-Exped.*, v (6), p. 47.

Chionodraco hamatus, Lönnberg, 1906, *K. Svensk. Vet.-Akad. Handl.*, XL (5), p. 99; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 288; Norman, 1937, *l.c.*, p. 77, figs. 7 A, 8.

Closely related to *C. kathleenae*, but with a somewhat larger eye, diameter of which is $4\frac{2}{3}$ in length of head; interorbital region broader, width $3\frac{2}{5}$ in length of head. Dorsal VII, 37. Anal 33. Pelvics shorter, $\frac{1}{2}$ length of head.

Hab. Graham Land; South Shetlands.

The type of the species, 330 mm. in total length, was from south of Snow Hill, Graham Land, at a depth of 125 metres. Through the kindness of Professor Dr H.

Rendahl, I have been able to examine this specimen, and to compare it with examples of *C. kathleenae* of similar size. Two damaged specimens, 125 and 135 mm. in total length, from Deception Island, South Shetlands (taken from the stomach of a Blue Whale); and two others, 67 and 69 mm. in total length, from the stomach of a Fin Whale, captured in the Weddell Sea ($65^{\circ} 04' S$, $54^{\circ} 12' W$), appear to belong to this species. As in the young of *C. kathleenae*, the eye is proportionately smaller in these small examples, the diameter being about 5 in the length of the head in specimens of 67 and 69 mm. The pelvic fin-rays are simple, and the pelvic fins are entirely pale.

Genus CHAENODRACO

Chaenodraco, Regan, 1914, *Ann. Mag. Nat. Hist.*, (8) XIII, p. 13; 1914, *Rep. Brit. Antarct.* ('*Terra Nova*') *Exped.* 1910, Zool. 1 (1), p. 12. Type *Chaenodraco wilsoni*, Regan.

Closely related to *Chionodraco*, but the supraorbital ridges are not crenulated, the gill-rakers are developed as dentigerous prominences, and the pelvic fins are each formed of a spine and only four rays.

A single species.

Coasts of the Antarctic Continent.

Chaenodraco wilsoni, Regan.

Chaenodraco wilsoni, Regan, 1914, *t.c.*, p. 13; 1914, *t.c.*, p. 12, pl. ix, fig. 1; Norman, 1937, *t.c.*, p. 79.

? *Chaenodraco fasciatus*, Regan, 1914, *t.c.*, p. 14; 1914, *t.c.*, p. 13, pl. ix, fig. 2.

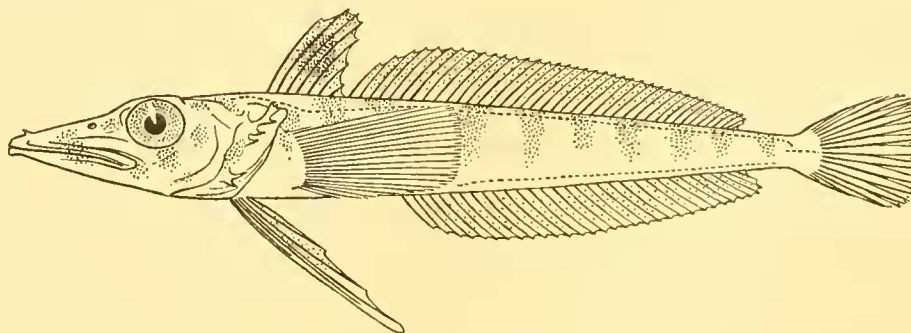


Fig. 51. *Chaenodraco wilsoni*. $\times \frac{1}{2}$.

Depth of body 6 to 7 in the length, length of head $2\frac{3}{5}$ to $3\frac{1}{5}$. Snout less than $\frac{1}{2}$ length of head; diameter of eye 4 (young) to $4\frac{1}{3}$, interorbital width $3\frac{3}{4}$ to $4\frac{1}{4}$ in length of head. Rostral spine antrorse. Jaws equal anteriorly or lower a little projecting; maxillary extending to below anterior $\frac{1}{4}$ or $\frac{1}{3}$ of eye. Operculum with a group of 4 or 5 spines, the uppermost bi- or tri-fid; 12 to 14 gill-rakers on lower part of anterior arch. Dorsal VI–VIII, 38–42; spinous dorsal separated from soft dorsal by a narrow interspace (young), or continuous with it at the base (adult). Anal 32–35. Pectoral with 22 to 24 rays, $\frac{3}{5}$ to nearly $\frac{2}{3}$ length of head, extending to above anterior rays of anal; pelvics I 4, as long as or nearly as long as head, extending to anterior part of anal or beyond. Caudal subtruncate or a little rounded. Pale brownish, with dark spots on the head

and with 5 blackish cross-bars on the body; sometimes some additional blotches or bars between the cross-bars; a large black spot on the spinous dorsal; other fins more or less dusky.

Hab. Mac-Robertson Land; South Victoria Land.

The type of the species, 250 mm. in total length, is from McMurdo Sound, 187 to 375 metres; the type of *C. fasciatus*, 92 mm. in total length, is from McMurdo Sound (77° 13' S, 164° 18' E), 380 metres. I have elsewhere given reasons for regarding these species as probably identical. A number of specimens, 205 to 268 mm. in total length, collected by the B.A.N.Z. Antarctic Research Expedition, are included in the above description.

ZOARCIDAE

*Key to the Antarctic Genera*¹

- I. Pelvic fins present; gill-opening cleft downward at least to middle of base of pectoral.
 - A. Origin of dorsal well behind base of pectoral 1. *LYCENCHELYS*
 - B. Origin of dorsal above base or anterior part of pectoral
 - 1. Mouth large, with wide lateral cleft; anterior canines in upper jaw and lateral canines in lower; palate toothless 2. *LYCODICHTHYS*.
 - 2. Mouth moderate, with short lateral cleft; no well-marked canines; teeth on palate.
 - 3. *AUSTROLYCICHTHYS*.
- II. No pelvic fins; gill-opening small, above base of pectoral 4. *MELANOSTIGMA*.

Genus *LYCENCHELYS*

Lycenchelys, Gill, 1884, *Proc. Acad. N.S. Philad.*, p. 110; Regan, 1913, *Trans. R. Soc. Edinburgh*, XLIX, p. 242. Type *Lycodes muraena*, Collett.

Form elongate, with the tail long and slender, body naked. Upper jaw projecting; teeth in jaws slender, uni- or bi-serial; teeth on vomer; palatine teeth uniserial. Gill-opening rather wide, cleft downward to lower end of base of pectoral. Origin of dorsal fin well behind base of pectoral; pelvic fins present.

Several species from deep water north of the Equator; one species from the Antarctic.

Lycenchelys antarcticus, Regan.

Lycenchelys antarcticus, Regan, 1913, *t.c.*, p. 242, pl. ix, fig. 3.

Depth of body 16 in the length, length of head 6. Head as broad as deep, its breadth a little more than $\frac{1}{3}$ its length. Snout twice as long as eye, diameter of which is 6 in

¹ In 1885, Fischer (*Jahrb. Hamburg. Wiss. Anst.*, 11, p. 60, pl. ii, fig. 9) described and figured a new genus and species of Zoarcid fish, *Gymnelichthys antarcticus*. The description was based upon 4 specimens, 110 to 220 mm. in total length, said to be from South Georgia. Through the kindness of Miss Erna Mohr, I have been able to examine three of these types, now preserved in the Hamburgisches Zoologisches Museum und Institut: No. 3902, 2 specimens, 110 and 120 mm.; No. 3942, 1 specimen, 183 mm.

As was the case with Fischer's genus of Cottidae, *Sclerocottus schraderi* (see Norman, 1935, *Copeia*, No. 3, p. 141), it seems likely that the type locality is incorrect, and that the fish were never collected at South Georgia. Comparison of these type specimens with material in the British Museum shows that they are referable to a species of Zoarcid common in Arctic seas, namely, *Gymnelis viridis* (Fabricius).

length of head; interorbital width about 16. Muciferous channels of sides of head and lower jaw with large pores. Teeth in jaws rather slender and obtuse, uniserial, biserial near symphysis of lower jaw; teeth on palate acute, wide-set. About 110 rays in dorsal fin, 9 in caudal, 103 in anal; origin of anal at a distance behind head equal to the length of the latter, $\frac{1}{3}$ as distant from vertical through origin of dorsal as from that through base of pectoral; pectoral a little more than $\frac{1}{2}$ as long as head. Bluish-grey; head darker; fins brownish grey.

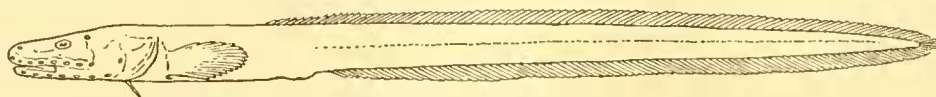


Fig. 52. *Lycenchelys antarcticus*. Holotype. $\times 1$.

Hab. Near the South Orkneys.

The type of the species, 128 mm. in total length, was obtained by the 'Scotia' at Station 313 ($62^{\circ} 10' S$, $41^{\circ} 20' W$), at a depth of 3225 metres. The specimen is preserved in the Royal Scottish Museum (Bruce collection), and I am indebted to the authorities of the museum for the loan of this fish for examination.

Genus **LYCODICHTHYS**

Lycodichthys, Pappenheim, 1911, *Sitzungsb. Ges. Naturf. Freunde*, p. 382; 1912, *Deutsche Südpol.-Exped.*, XIII, Zool. v, p. 180; Regan, 1913, *t.c.*, p. 244. Type *Lycodichthys antarcticus*, Pappenheim.

Form moderately elongate; body with rounded scales embedded in the skin. Upper jaw projecting; mouth large, with wide lateral cleft; teeth conical, uniserial; anterior pair in upper jaw enlarged; lateral teeth of lower jaw spaced, canine-like; palate toothless. Gill-opening rather wide, cleft downward almost to lower end of base of pectoral. Origin of dorsal fin just behind head, above anterior part of pectoral; pelvic fins present.

A single species from the coasts of the Antarctic Continent.

Lycodichthys antarcticus, Pappenheim.

Lycodichthys antarcticus, Pappenheim, 1911, *t.c.*, p. 383; 1912, *t.c.*, p. 180, pl. ix, fig. 6, pl. x, fig. 4; Regan, 1913, *t.c.*, p. 244; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 14.

Depth of body 8 or 9 in the length, length of head 5 to $5\frac{1}{2}$. Diameter of eye 5 to 6 in length of head. Maxillary extending to below posterior margin of eye or a little beyond. Dorsal with 85 to 90 rays, anal with about 65, caudal with about 10; origin of anal 1 to $1\frac{1}{3}$ head-lengths behind head; pectoral $\frac{1}{2}$ length of head. Yellowish brown; head, body and fins spotted or marbled with darker brown.

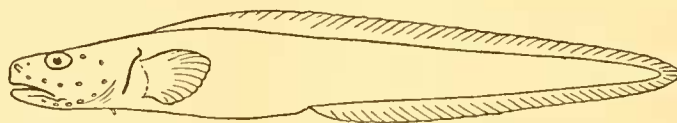


Fig. 53. *Lycodichthys antarcticus*. $\times \frac{1}{2}$.

Hab. Wilhelm Land.

This species was originally described from 25 specimens, 110 to 200 mm. in total length, from the Winter Station of the 'Gauss', depth 385 metres: 2 co-types, 160 and 200 mm. in total length, are in the collection of the British Museum.

Genus AUSTROLYCICHTHYS

Austrolycichthys, Regan, 1913, *t.c.*, p. 244. Type *Lycodes brachycephalus*, Pappenheim.

Form elongate, compressed; body with rounded scales embedded in the skin. Jaws level anteriorly or upper somewhat projecting; mouth moderate, with short lateral cleft; teeth conical, in two or more series in both jaws, at least anteriorly; no well-marked canines; teeth on vomer and palatines. Gill-opening cleft downward at least to middle of base of pectoral. Origin of dorsal fin just behind head, above or a little behind base of pectoral; pelvic fins present.

Three species from Antarctic Seas.

Key to the Species

- I. Gill-opening cleft downward nearly to lower end of base of pectoral; tail from less than $1\frac{1}{2}$ to about $1\frac{3}{4}$ times as long as rest of fish; anal with about 68 to 70 rays; inside of mouth pale.
 - A. Pores on head not very conspicuous; origin of anal $1\frac{2}{5}$ to $1\frac{2}{3}$ head-lengths behind head; upper jaw a little projecting ... 1. *brachycephalus*.
 - B. Pores on head very conspicuous; origin of anal a little more than 1 head-length behind head; upper jaw strongly projecting ... 2. *concolor*.
- II. Gill-opening cleft downward to a little below middle of base of pectoral; tail about $2\frac{1}{4}$ times as long as rest of fish; anal with about 90 rays; inside of mouth blackish.
 3. *bothriocephalus*.

Austrolycichthys brachycephalus (Pappenheim).

Lycodes brachycephalus, Pappenheim, 1912, *Deutsche Südpol.-Exped.*, XIII, Zool. v, p. 179, pl. x, fig. 3.

Austrolycichthys brachycephalus, Regan, 1913, *t.c.*, p. 244, text-fig. 2; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 15, pl. i, fig. 1, text-figs. 2, 2a.

St. 1652. 23. i. 36. $75^{\circ} 56.2' S$, $178^{\circ} 35.5' E$. Rectangular dredge, with Russell net, 567 m.: 1 specimen, 280 mm.

Depth of body 8 to $10\frac{1}{2}$ in the length, length of head $5\frac{1}{5}$ to $6\frac{2}{3}$. Tail from less than $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as rest of fish. Pores on head not conspicuous. Diameter of eye 5 to nearly 6 in length of head. Maxillary extending to below anterior part of eye; upper jaw a little projecting; teeth in 2 or 3 series anteriorly, usually becoming uniserial laterally; vomerine teeth in a group, palatine teeth in 2 rows. Gill-opening cleft downward to or nearly to lower end of base of pectoral. Dorsal with about 90 rays, anal with about 70, caudal with 10; origin of anal $1\frac{2}{5}$ to $1\frac{2}{3}$ head-lengths behind head; pectoral $\frac{2}{3}$ to $\frac{4}{5}$ length of head. Greyish or brownish; inside of mouth pale.

Hab. Wilhelm Land; Queen Mary Land; South Victoria Land.

This species was originally described from 58 specimens from the Winter Station of

the 'Gauss', depth 380 metres, of which 2 examples, 150 and 155 mm. in total length, are in the collection of the British Museum. The 'Aurora' obtained other examples from off Shackleton Ice-shelf ($65^{\circ} 6' \text{ S}$, $96^{\circ} 13' \text{ E}$), 600 metres, and off the Western Base ($66^{\circ} 18' \text{ S}$, $94^{\circ} 58' \text{ E}$), 494 metres.

***Austrolycichthys concolor* (Roule & Despax).**

Lycodes concolor, Roule and Despax, 1911, *Bull. Mus. Paris*, 1911, No. 5, p. 279; Roule, Angel and Despax, 1913, *Deux. Expéd. Antarct. Franç.* (1908-1910), Poiss., p. 19, pl. ii, fig. 3, pl. iii, fig. 6.

St. 195. 30. iii. 27. Admiralty Bay, King George Island, South Shetlands. Net (7 mm. mesh) attached to back of trawl, 391 m.: 1 specimen, 125 mm.

Depth of body $9\frac{3}{4}$ in the length, length of head about $5\frac{3}{8}$. Tail about $1\frac{3}{4}$ times as long as rest of fish. Pores on head large and conspicuous. Diameter of eye nearly 5 in length of head, nearly equal to interocular width. Maxillary extending to beyond anterior margin of eye; upper jaw strongly projecting; several rows of small teeth in each jaw; a small group of teeth on the vomer and a single tooth on each palatine. Gill-opening cleft downward to lower end of base of pectoral. Dorsal with about 75 rays, anal with about 70, caudal with about 10; origin of anal a little more than a head-length behind head; pectoral about $\frac{3}{8}$ length of head. Pale yellowish-brown, the upper parts of the sides irregularly marbled with darker.

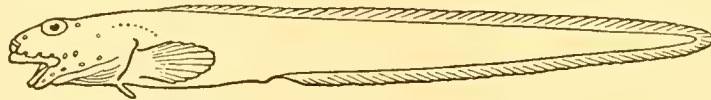


Fig. 54. *Austrolycichthys concolor*. $\times \frac{3}{4}$.

Hab. South Shetlands.

The above specimen agrees well with the description of the type, which was 175 mm. in total length. I am indebted to Dr C. F. Angel for information concerning the type specimen preserved in the Paris Museum (No. 11-99).

***Austrolycichthys bothriocephalus* (Pappenheim).**

Lycodes bothriocephalus, Pappenheim, 1912, *t.c.*, p. 178, pl. x, fig. 2.

Austrolycichthys bothriocephalus, Regan, 1913, *t.c.*, p. 245; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, 1, p. 80, fig. 10.

Depth of body 11 in the length, length of head a little more than 6. Tail about $2\frac{1}{4}$ times rest of fish. Pores on head very large and conspicuous. Diameter of eye about 5 in length of head. Maxillary extending to below anterior margin of eye; jaws level anteriorly; teeth small, in 2 or 3 series anteriorly in both jaws, becoming uniserial laterally; a small patch of teeth on the vomer and a pair of teeth (placed one behind the other) on each palatine. Gill-opening cleft downward to a little below middle of base of pectoral. Dorsal with about 110 rays, anal with about 90, caudal with about 10; origin of anal about one head-length behind the head; pectoral about $\frac{2}{3}$ length of head. Brownish, irregularly and faintly variegated with paler; inside of mouth and branchial cavities blackish.

Hab. Enderby Land; Wilhelm Land.

The type of the species, 181 mm. in total length, was from the Winter Station of the 'Gauss', depth 380 metres. The above description is based upon another specimen, 114 mm. long, obtained by the B.A.N.Z. Antarctic Research Expedition off Enderby Land (66° 12' S, 49° 37' E), at a depth of 300 metres, which appears to belong to Pappenheim's species.

Genus MELANOSTIGMA

Melanostigma, Günther, 1881, *Proc. Zool. Soc.*, p. 21; Regan, 1913, *t.c.*, p. 248; Norman, 1937, *Discovery Rep.*, xvi, p. 109. Type *Melanostigma gelatinosum*, Günther.

Form elongate, compressed; body naked. Mouth terminal; teeth uniserial in both jaws and on vomer and palatines. Gill-opening small, above base of pectoral. Origin of dorsal fin just behind head; no pelvic fins.

Several species from deep water in the Atlantic and Pacific; one from the Subantarctic and Antarctic Zones.

Melanostigma gelatinosum, Günther.

Melanostigma gelatinosum, Günther, 1881, *t.c.*, p. 21, pl. ii, fig. A; Regan, 1913, *t.c.*, p. 248; Norman, 1937, *t.c.*, p. 109.

St. 1082. 29. xii. 32. 53° 44' S, 38° 30.9' W. 1 m. tow-net, oblique, 290–120 m.: 1 specimen, 205 mm.

Depth of body 7 to 10 in the length, length of head 6. Diameter of eye $3\frac{1}{3}$ to 4 in length of head, interorbital width 8 to about 12. Mouth oblique; maxillary extending to below middle of eye. Origin of anal a head-length behind head; pectoral nearly $\frac{1}{2}$ length of head. Pale yellowish-brown, the sides in young spotted and marbled with purplish-grey; end of tail blackish; inside of mouth and gill-openings black.

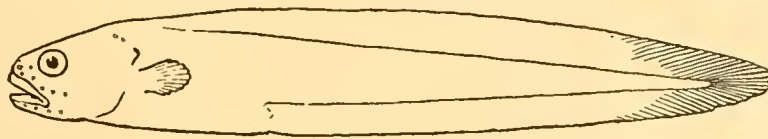


Fig. 55. *Melanostigma gelatinosum*. $\times \frac{1}{2}$.

Hab. Straits of Magellan; north-west of South Georgia.

The type of the species, 140 mm. in total length, was captured at a depth of about 45 metres. This represents one of the very few species found both in the Antarctic and Subantarctic Zones.

CONGIOPODIDAE

Zanclorhynchus spinifer, Günther.

Zanclorhynchus spinifer, Günther, 1880, *Shore Fish. 'Challenger'*, p. 15, pl. viii, fig. A; Waite, 1916, *Austral. Antarct. Exped. Sci. Rep.*, Ser. C, III (1), Fishes, p. 72; Norman, 1937, *Rep. B.A.N.Z. Antarct. Res. Exped.*, Ser. B, 1, p. 59, fig. 4.

Hab. Kerguelen; Macquarie Island.

The type of the species from Kerguelen is 90 mm. in total length. Waite recorded two specimens (202 and 238 mm.) from Macquarie Island, and the B.A.N.Z. Antarctic Research Expedition obtained 7 specimens (50 to 175 mm.).

LIPARIDAE

Paraliparis gracilis, Norman.

Paraliparis gracilis, Norman, 1930, *Discovery Rep.*, 11, p. 352, fig. 42.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia. Large otter trawl, 179–235 m.: 15 specimens, 40–115 mm.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia. Large otter trawl, 120–204 m.: 2 specimens, 103, 115 mm.

St. WS 32. 21. xii. 26. Mouth of Drygalski Fjord, South Georgia. Small beam trawl, 91–225 m.: 2 specimens, 45, 58 mm.

St. 142. 30. xii. 26. East Cumberland Bay, South Georgia. Net (4 mm. mesh) attached to back of trawl, 88–273 m.: 5 specimens, 52–95 mm.

St. 154. 18. i. 27. Jason Harbour to Larsen Point, South Georgia. Net (4 mm. mesh) attached to back of trawl, 60–160 m.: 9 specimens, 42–50 mm.

Depth of body 5 to $5\frac{1}{2}$ in the length, length of head $4\frac{1}{5}$ to nearly 6. Diameter of eye about 3 in length of head. Dorsal 58–66. Anal 56–63. Pectoral with an upper portion of 10 to 12 rays.

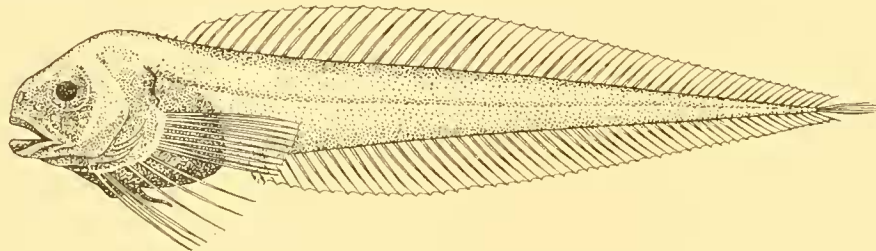


Fig. 56. *Paraliparis gracilis*. Holotype. $\times 1\frac{1}{2}$.

Hab. South Georgia and neighbourhood.

The holotype of the species, 70 mm. in total length, is from $53^{\circ} 48' 00''$ S, $35^{\circ} 37' 30''$ W, 728 metres. The other Antarctic species are *P. antarcticus*, Regan [?= *P. wildi*, Waite]; and *P. terrae-novae*, Regan. I have given a key to these species in my report on the oceanic fishes (1930, *t.c.*, p. 352).

Careproctus georgianus, Lönnberg.

Careproctus georgianus, Lönnberg, 1905, *Wiss. Ergebn. Schwed. Südpol.-Exped.*, v (6), p. 41, pl. iii, fig. 11; Burke, 1930, *Bull. U.S. Nat. Mus.*, CL, p. 122.

St. MS 68. 2. iii. 26. East Cumberland Bay, South Georgia. Large rectangular net, 220–247 m.: 1 specimen, 55 mm.

St. 142. 30. xii. 26. East Cumberland Bay, South Georgia. Nets (4 mm. and 7 mm. mesh) attached to back of trawl, 88–273 m.: 7 specimens, 27–90 mm.

St. 144. 5. i. 27. Off mouth of Stromness Harbour, South Georgia. Large otter trawl, 155–178 m.: 3 specimens, 12–14 mm.

Depth of body $4\frac{3}{5}$ to about 5 in the length, length of head 4 to $4\frac{3}{4}$. Diameter of eye $\frac{1}{2}$ interorbital width, about 4 in length of head. Teeth simple. Gill-opening above base of pectoral. Dorsal 45–52. Anal 42–46. Pectoral with about 30 rays.

Hab. South Georgia.

This species, which was not previously represented in the British Museum collection, was originally described from 2 specimens, 63 and 105 mm. in total length, from South Fjord, Cumberland Bay, depth 195 metres.

Liparis steineni, described by Fischer (1885, *Jahrb. Hamb. Wiss. Anst.*, II, p. 63) may belong to this genus. The types, 2 specimens 65 and 70 mm. in total length, were said to be from tide pools or shallow waters, Royal Bay, South Georgia.

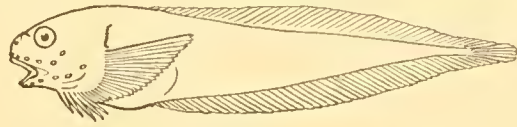


Fig. 57. *Careproctus georgianus*. $\times \frac{3}{4}$.

BOTHIDAE

Mancopsetta maculata (Günther).

Lepidopsetta maculata, Günther, 1880, *Shore Fish. 'Challenger'*, p. 18, pl. xxx, fig. C; Norman, 1930, *Discovery, Rep.*, II, p. 361.

Mancopsetta maculata, Norman, 1934, *Syst. Monogr. Flatfish.*, 1, p. 248, fig. 189.

St. 158. 21. i. 27. $53^{\circ} 48' 30''$ S, $35^{\circ} 57' 00''$ W. Large dredge, 401–411 m.: 1 specimen, 270 mm.

Hab. South Atlantic, north of the Falkland Islands; north-east of South Georgia; southern Indian Ocean, near Prince Edward's Island.

The type of the species, 134 mm. in total length, was collected by the 'Challenger' at Station 145, at a depth of 580 metres. The 'William Scoresby' obtained another example, 238 mm. long, from $45^{\circ} 45' 00''$ S, $59^{\circ} 35' 00''$ W, at a depth of 311 to 247 metres. This represents another species found in both the Antarctic and Subantarctic Zones.

GENERAL PART

THE ANTARCTIC ZONE

In his report on the fishes of the 'Terra Nova' Expedition, Regan (1914*b*) has discussed in detail the distribution of Antarctic and Subantarctic fishes, and has defined three zones of distribution south of the Tropical Zone, namely, the South Temperate Zone, the Subantarctic Zone, and the Antarctic Zone. This last region was said to include "the coasts of the Antarctic continent and the islands that lie to the south of the isotherm of 6° C., with the possible exception of Macquarie Island". This zone was further subdivided into two districts, Glacial and Kerguelen. The Glacial District includes the coasts of the Antarctic continent and neighbouring islands, together with South Georgia, the South Sandwich Islands, and Bouvet Island, all situated within the extreme limit of the pack-ice. The Kerguelen District includes the island of Kerguelen and also Heard Island, the Crozet Islands, and Marion and Prince Edward Islands: as will be seen, there appears to be good reason for including Macquarie Island within this district.

The mean annual surface isotherms of 6° C. and 12° C. correspond on the whole fairly closely to the Antarctic and Subtropical Convergences as delimited by Deacon¹ in his valuable paper on the hydrology of the Southern Ocean. The following classifi-

¹ 1937, *Discovery Reports*, xv, pp. 1–124, pls. i–xliv.

cation for the distribution of Antarctic Fishes, therefore, follows almost exactly that proposed by Regan:

ANTARCTIC ZONE. The area bounded to the north by the Antarctic Convergence.

Glacial District. Antarctic Continent; South Shetlands; South Orkneys; South Sandwich Islands; South Georgia; Bouvet Island.

Kerguelen-Macquarie District. Kerguelen; Heard Island; Crozets; Marion and Prince Edward Islands; Macquarie Island.

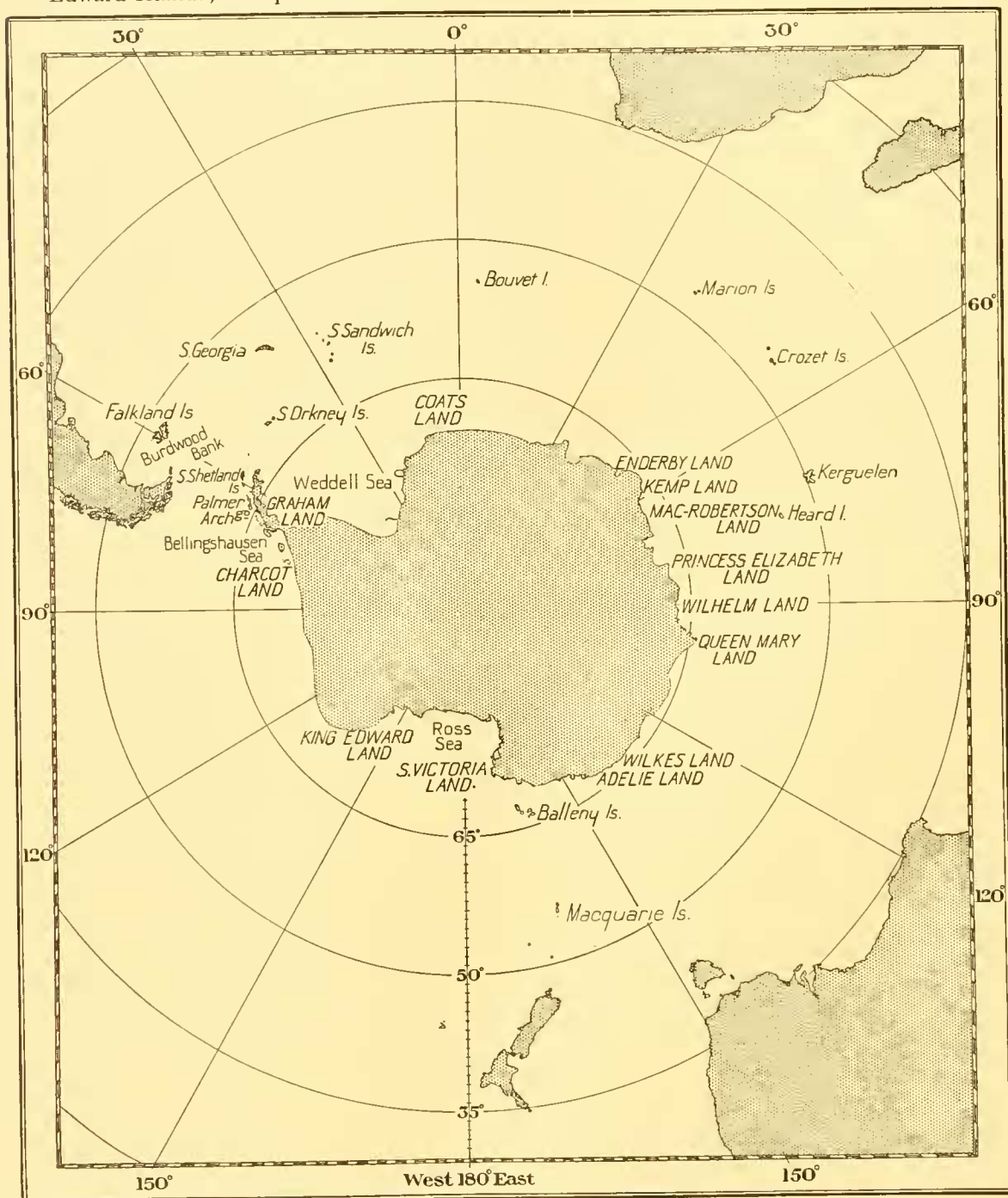


Fig. 58. Map showing the principal localities mentioned in the text.

HISTORICAL¹

The voyages of the 'Erebus' and 'Terror', under the command of Sir J. C. Ross, during the years 1839 to 1843, resulted in the first specimens of fishes from the Antarctic Zone being brought to this country, examples of four species being collected at Kerguelen.

The fishes were reported upon by Richardson (1844-1848) who gave the following names to the species from Kerguelen:

Notothenia cyanobranca, Richardson.

N. purpuriceps, Richardson (*N. cyanobranca*).

N. coriiceps, Richardson.

Chaenichthys rhinoceratus, Richardson.

The following species was described from an unknown locality, but was quite likely captured at Kerguelen:

Notothenia? *rossii*, Richardson.

In addition, Richardson mentions three other fishes in his report, which appear to have been obtained in the true Glacial District:²

Sphyraena. (?? *Gymnodraco acuticeps*.)

Notothenia phocae, Richardson. (An unidentifiable *Nototheniid*.)

Pagetodes, Richardson (? *Cryodraco antarcticus*).

During the years 1874 to 1875 two expeditions visited Kerguelen to observe the "Transit of Venus", both of which collected a few specimens of fishes during their stay on the island.

The fishes collected by the American expedition were dealt with by Gill (1876), who recorded the following species from the Antarctic Zone for the first time:

Harpagifer bispinis (Schneider).

Günther (1879) reported upon the specimens obtained by the British expedition, and described a new species of Ray from this district:

Raja eatonii, Günther.

¹ A valuable historical summary of early Antarctic voyages, commencing with that of Captain Cook in the years 1772-1775, has been given by Dollo (1904, pp. 5-11).

² Concerning the first two of these, Richardson (p. 8) writes: "On the 14th of January 1842, when the ships were embayed among ice on the 65th parallel of south latitude and about the 155th west meridian, a seal was taken with twenty-eight pounds of fish in its stomach. The fish were of two kinds, one a *Sphyraena*, the other a *Notothenia*, of which there were many mutilated individuals. Dr Hooker made a careful drawing of the most perfect, and put several examples in spirits. . . ." I have been quite unable to trace either the drawing or the spirit specimens, so that *Notothenia phocae* must be regarded as unidentifiable, since the description is quite inadequate. No description of the *Sphyraena* is given, but Dollo (1904, p. 9) has suggested that this may have been a specimen of *Gymnodraco acuticeps*, Boulenger.

Concerning *Pagetodes*, he writes: "When the ships were in the high latitude of 77° 10' S, and long. 178½° [W], a fish was thrown up by the spray in a gale of wind, against the bows of the Terror and frozen there." Unfortunately, this specimen, which was 160 mm. in total length, was appropriated by the ship's cat before a detailed drawing or description could be made, and the rough sketch reproduced by Richardson (pl. viii, fig. 3) is not sufficiently accurate, to admit of positive identification. It seems probable, however, that this fish was of the same species as that described later by Dollo as *Cryodraco antarcticus*.

The S.M.S. 'Gazelle' (1874–1876), under the command of Captain F. von Schleinitz, visited Kerguelen during her voyage. The zoological results were edited by Studer (1889), but the single new fish obtained from this zone had been previously described by Peters (1876):

Notothenia antarctica, Peters (*N. macrocephala*).

The 'Challenger', under the command of Sir G. S. Nares, made valuable collections at Kerguelen, Marion Island and Prince Edward's Island, which were reported upon by Günther (1880, 1887), and the following additions made to the fish-fauna of the Kerguelen District:

Raja murrayi, Günther.

Muraenolepis marmoratus, Günther.

Notothenia acuta, Günther.

N. marionensis, Günther.

N. mizops, Günther.

N. squamifrons, Günther.

Bathyraco antarcticus, Günther.

Zanclorhynchus spinifer, Günther.

Lepidopsetta maculata, Günther (*Mancopsetta maculata*).

The 'Deutschen Polarkommission' (1882–1883) obtained a few fishes from South Georgia, which were described by Fischer (1885), who added the following species to the list of Antarctic fishes:¹

Notothenia marmorata, Fischer (*N. rossii*).

N. angustifrons, Fischer.

Chaenichthys georgianus, Fischer (*Parachaenichthys georgianus*).

Liparis steineni, Fischer (? *Careproctus steineni*).

The voyage of the S.Y. 'Belgica' (1897–1899), under the command of A. de Gerlache de Gomery, with Dr E. G. Racovitza as naturalist, led to the addition of the following species to the list. The collection, which included the first fishes actually obtained from within the Antarctic Circle,² was reported upon by Dollo (1900, 1904):

Raja arctowskii, Dollo.

Gerlachea australis, Dollo.

Racovitzia glacialis, Dollo.

Cryodraco antarcticus, Dollo.

The 'Southern Cross' (1898–1900), under the command of Mr C. E. Borchgrevink, obtained a valuable collection of fishes, working mainly in the Victoria Quadrant. These were described by Boulenger (1902), and the following added to the list:

Notothenia nicolai, Boulenger (*Trematomus nicolai*).

Trematomus newnesi, Boulenger.

T. borchgrevinkii, Boulenger.

T. hansonii, Boulenger.

T. bernacchii, Boulenger.

Pleuragramma antarcticum, Boulenger.

Gymnodraco acuticeps, Boulenger.

¹ See footnote on p. 81 of this report.

² This expedition worked mainly in the Weddell Quadrant, but one or two specimens were obtained from the Ross Quadrant.

The Swedish South Polar Expedition, with the 'Antarctic', under the direction of Dr O. Nordenskjöld, visited South Georgia, and also made collections of fishes at Graham Land and the neighbouring islands (Weddell Quadrant). The fishes were reported upon by Lönnberg (1905), who added the following to the Antarctic list:

- Muraenolepis marmoratus microps*, Lönnberg (*M. microps*).
- Notothenia dubia*, Lönnberg (? *Trematomus vicarius*).
- N. mizops nudifrons*, Lönnberg (*N. nudifrons*).
- N. larseni*, Lönnberg.
- N. gibberifrons*, Lönnberg.
- Trematomus hansonii georgianus*, Lönnberg (*T. hansonii*).
- T. bernacchi vicarius*, Lönnberg (*T. vicarius*).
- Artedidraco mirus*, Lönnberg.
- A. skottsbergi*, Lönnberg.
- Champscephalus gunnari*, Lönnberg.
- Chaenichthys rhinoceratus hamatus*, Lönnberg (*Chionodraco hamatus*).
- Careproctus georgianus*, Lönnberg.

The German South Polar Expedition (1901–1903), with the 'Gauss', under the leadership of Erich von Drygalski, visited Kerguelen and also collected near the boundary between the Victoria and Enderby Quadrants of the Antarctic Continent. The fishes were dealt with by Pappenheim (1911, 1912), who added the following new species:

- Notothenia lepidorhinus*, Pappenheim (*Trematomus lepidorhinus*).
- Trematomus brachysoma*, Pappenheim.
- Lycodes bothriocephalus*, Pappenheim (*Austrolycichthys bothriocephalus*).
- L. brachycephalus*, Pappenheim (*Austrolycichthys brachycephalus*).
- Lycodichthys antarcticus*, Pappenheim.

The National Antarctic Expedition (1901–1904), with the 'Discovery' under Captain R. F. Scott, obtained a few specimens in the Victoria Quadrant, which were described by Boulenger (1907). The following species were added to the Antarctic list:

- Notothenia scotti*, Boulenger (*Trematomus scotti*).
- N. hodgsoni*, Boulenger (*Trematomus newnesi*).
- Bathydraco macrolepis*, Boulenger.
- Champscephalus macropterus*, Boulenger (*Pagetopsis macropterus*).

The Scottish National Antarctic Expedition (1902–1904), with the 'Scotia', under the leadership of Dr W. S. Bruce, made important collections in the neighbourhood of the South Orkneys and Coats Land in the Weddell Quadrant. Dollo (1906, 1907, 1908, 1909) presented several preliminary descriptions of fishes obtained by this expedition, but the complete report was prepared by Regan (1913). A complete monograph of the Nototheniiform fishes was included in this report, and the following species were added to the list:

- Notothenia vaillanti*, Regan (*N. gibberifrons*).
- Trematomus loennbergii*, Regan.
- Bathydraco scotiae*, Dollo.
- Chaenichthys rugosus*, Regan.
- Cryodraco pappenheimi*, Regan.

The French Antarctic Expedition (1903–1905), with the 'Français', under the command of Dr Jean Charcot, collected off Graham Land and the neighbouring islands (Weddell Quadrant). The fishes were described by Vaillant (1905, 1906), who added the following new names to the faunal list:

Dissostichus eleginoides Smitt (*D. mawsoni*).

Chaenichthys charcoti, Vaillant (*Parachaenichthys charcoti*).

Lönnberg (1906) described some fishes from South Georgia, collected by Mr Erich Sörling, and added one new species to the list of those known from the island:

Chaenichthys aceratus, Lönnberg (*Chaenocephalus aceratus*).

The British Antarctic Expedition (1907–1909), with the 'Nimrod', under the command of Sir Ernest Shackleton, collected a few fishes in the Victoria Quadrant, which were reported upon by Waite (1911), who added one new species:

Artedidraco shackletoni, Waite.

The Second French Antarctic Expedition (1908–1910), with the 'Pourquoi-Pas?', under the command of Dr Jean Charcot, made valuable collections in the Weddell Quadrant of the Antarctic. These were studied by Roule and Despax (1911) and by Roule, Angel and Despax (1913), who described three new forms:

Artedidraco loennbergi, Roule.

Dolloidraco longedorsalis, Roule.

Lycodes concolor, Roule and Despax (*Austrolycichthys concolor*).

The British Antarctic ('Terra Nova') Expedition (1910), under Captain R. F. Scott, made very rich collections of fishes in the Victoria Quadrant. These were reported upon by Regan (1914, 1916), who described the following new species:

Trematomus pennellii, Regan.

T. centronotus, Regan.

T. eulepidotus, Regan.

Artedidraco oriana, Regan.

Histiodraco velifer, Regan.

Pogonophryne scotti, Regan.

Prionodraco evansii, Regan.

Cryodraco atkinsoni, Regan (*C. antarcticus*).

Chionodraco kathleenae, Regan.

Chaenodraco wilsoni, Regan.

C. fasciatus, Regan (? *C. wilsoni*).

Paraliparis antarcticus, Regan.

P. terrae-novae, Regan.

The Australasian Antarctic Expedition (1911–1914), with the 'Aurora', under the leadership of Sir Douglas Mawson, obtained a number of fishes from Macquarie Island and from the Victoria Quadrant of the Antarctic continent. These were described by Waite (1916), who added the following names to the Antarctic list:

Notothenia coriiceps var. *macquariensis*, Waite (*N. rossii*).

Bathydraco nudiceps, Waite.

Aconichthys harrissoni, Waite (*Racovitzia harrissoni*).

Cygnodraco mawsoni, Waite.

Dacodraco hunteri, Waite.

Paraliparis wildi, Waite (? *P. antarcticus*).

Finally, the British, Australian, New Zealand Antarctic Research Expedition (1929-1931), with the 'Discovery', under the leadership of Sir Douglas Mawson, made extensive collections in the Victoria and Enderby Quadrants of the Antarctic, and also obtained fishes from Kerguelen, Heard Island, the Crozets, and from Macquarie Island. The fishes were reported upon by Norman (1937), who described two new forms:

Muraenolepis microcephalus, Norman.

Dissostichus mawsoni, Norman.

DISTRIBUTION OF ANTARCTIC COAST FISHES

It has been pointed out in the introduction to this report that, of the 86 species of fish recorded from the Antarctic Zone, 65 (75 per cent) belong to the Percoid Division Nototheniiformes. Taking the Glacial District alone, the percentage rises to 76, and for the coasts of the Antarctic Continent it is nearly 85. It follows, therefore, as Regan (1914*b*, p. 26) has pointed out, that this group of fishes is of paramount importance in delimiting an Antarctic region or zone. The table on page 95 shows the distribution of those species of Nototheniiform fishes occurring within the area bounded by the Antarctic Convergence (fig. 59). The Glacial District is dealt with first, the four quadrants of the Antarctic Continent preceding the more outlying islands; the localities of the Kerguelen-Macquarie District follow, and finally the Subantarctic districts—the Patagonian region and the Antipodes.

A glance at the two right-hand columns shows at once the importance of the Convergence as a boundary for Antarctic coast fishes. Of the 65 species listed, only three (*Notothenia macrocephala*, *N. colbecki*, *Harpagifer bispinis*) occur also in the Subantarctic Zone, and only one of these (*H. bispinis*) is common to the Glacial District and the Subantarctic Zone. Of the 26 genera listed, 21 are peculiar to the Glacial District, 1 is peculiar to the Kerguelen-Macquarie District, and 4 are found also in the Subantarctic Zone. Of these four genera, *Harpagifer* is monotypic, *Dissostichus* and *Champscephalus* each have one species in the Antarctic and one in the Subantarctic Zone, and the large genus *Notothenia* is well represented in both zones.

Regan (*t.c.*, p. 29) has shown that the species of *Notothenia* form five natural groups, and the species occurring in the Antarctic Zone may be distributed in these groups as follows:

"tessellata" group	"squamifrons" group	"acuta" group	"marionensis" group	"coriiceps" group
	<i>squamifrons</i> <i>kempi</i> <i>larseni</i>	<i>mizops</i> <i>nudifrons</i> <i>gibberifrons</i> <i>acuta</i>	<i>angustifrons</i> <i>marionensis</i>	<i>coriiceps</i> <i>rossii</i> <i>macrocephala</i> <i>colbecki</i>

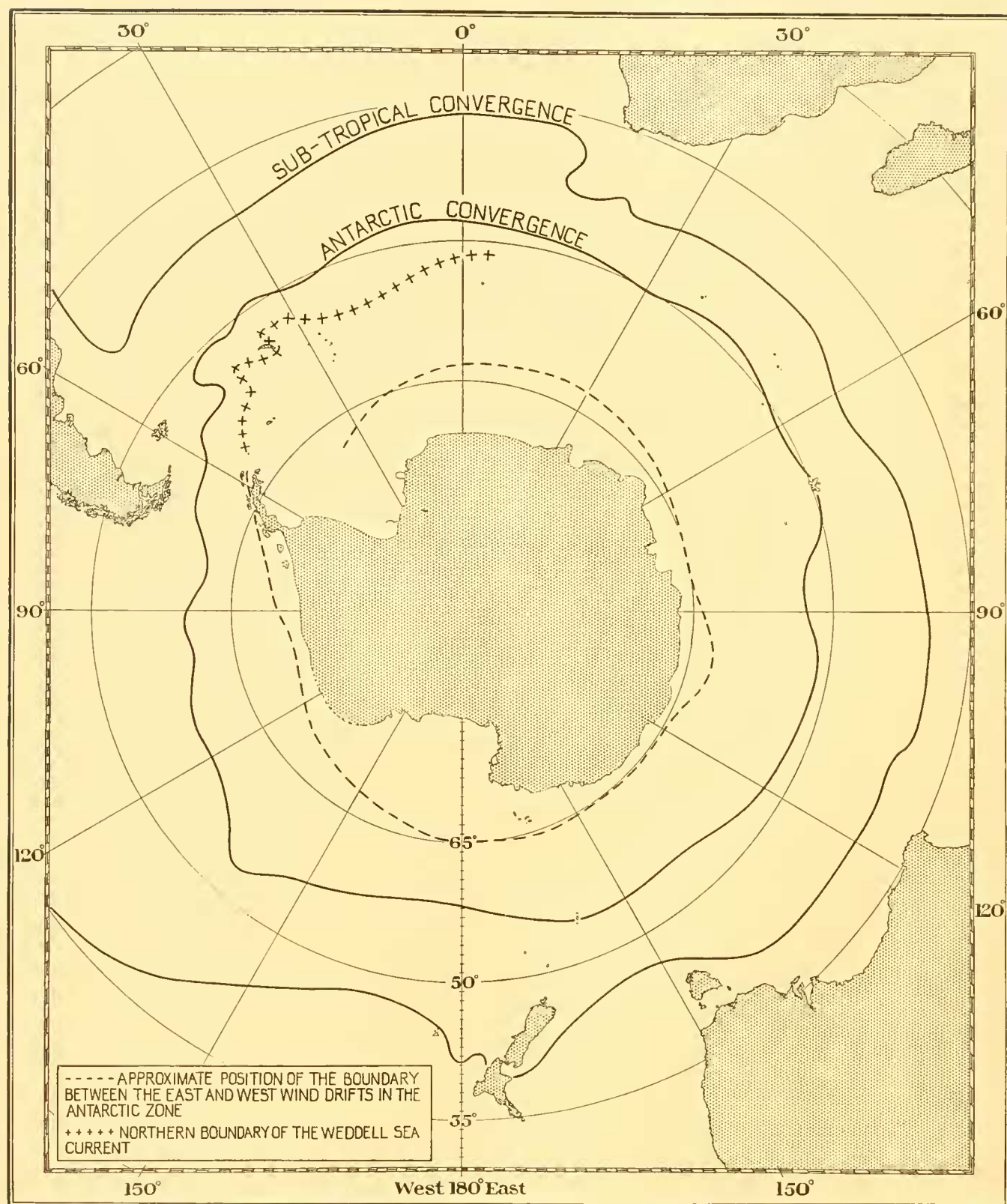


Fig. 59. The Antarctic and subtropical convergences, the northern boundary of the Weddell Sea current, and the approximate position of the boundary between the East and West Wind Drifts. (After Deacon.)

Table I.

[illegible]

It will be seen that the "*tessellata*" group, so characteristic of the Patagonian Region, is altogether wanting in the Antarctic Zone. Another interesting fact clearly shown by this table as well as by the map (Plate I) is that, although the genus *Notothenia* is well represented by six species on the coasts of Graham Land and at the neighbouring South Shetlands, it is represented in the Victoria Quadrant of the Antarctic Continent only by *N. coriiceps*, and has not been found at all in the Enderby and Ross Quadrants. It may be noted that *N. coriiceps* is probably not so demersal or littoral in its habits as many other species of the genus, and the silvery young may be mainly pelagic. From Graham Land species of *Notothenia* spread eastwards to the South Orkneys, South Sandwich Islands, South Georgia and Bouvet Island in the Glacial District, and other species occur in the Kerguelen-Macquarie District. In contrast to *Notothenia*, the genus *Trematomus* occurs in all four quadrants of the Antarctic Continent, extending northwards in the Weddell Quadrant to the South Orkneys and South Georgia, but not reaching Bouvet Island; it is absent altogether in the Kerguelen-Macquarie District.

With regard to the Zoarcidae, the group next in importance to the Nototheniiformes, I have little to add to the remarks on their distribution made by Regan (*t.c.*, pp. 31-33). Two of the Antarctic species are the southern representatives of the northern deep-water genera *Lycenchelys* and *Melanostigma*: *Melanostigma gelatinosum* is found in both Antarctic and Subantarctic Zones. The remainder are all generically distinct from the northern members of the family. The two genera *Lycodichthys* and *Austrolycichthys* (the first monotypic, the second with three species) are peculiar to the Antarctic and are confined to the Glacial District.

THE ANTARCTIC ZONE¹

This includes the coasts of the Antarctic Continent and all the islands lying on or to the south of the Antarctic Convergence (fig. 59).

To quote Regan (*t.c.*, p. 33), "it is characterised by the complete absence of South Temperate types, by the absence of Bovichthyidae [the most generalised family of Nototheniiformes] and by the great development of other Nototheniiformes". The percentage of genera peculiar to this region is high (about 67 per cent), and the percentage of peculiar Nototheniiform genera very high (85 per cent). The percentage of species ranging beyond the limits of the Antarctic Zone is very low indeed (less than 10 per cent).

Glacial District

This includes the coasts of the Antarctic Continent and neighbouring islands, together with South Georgia, the South Sandwich Islands, and Bouvet Island, all found within the extreme limit of pack-ice.

NOTOTHENIIDAE. *Notothenia* (7 species); *Trematomus* (13 species); *Dissostichus* (1 species); *Pleuragramma* (1 species).

¹ The data which follow are arranged exactly as in Regan's report (1914*b*, p. 33) to facilitate ready reference and comparison.

Trematomus and *Pleuragramma* are restricted to this district, and of the 7 species of *Notothenia*, 5 are peculiar, only *N. coriiceps* and *N. rossii* ranging to the Kerguelen-Macquarie District. *N. angustifrons* is confined to South Georgia and the South Sandwich Islands. *Dissostichus* is represented by *D. mawsoni* in this district, and there is one other species (*D. eleginoides*) in the Patagonian Region of the Subantarctic Zone.

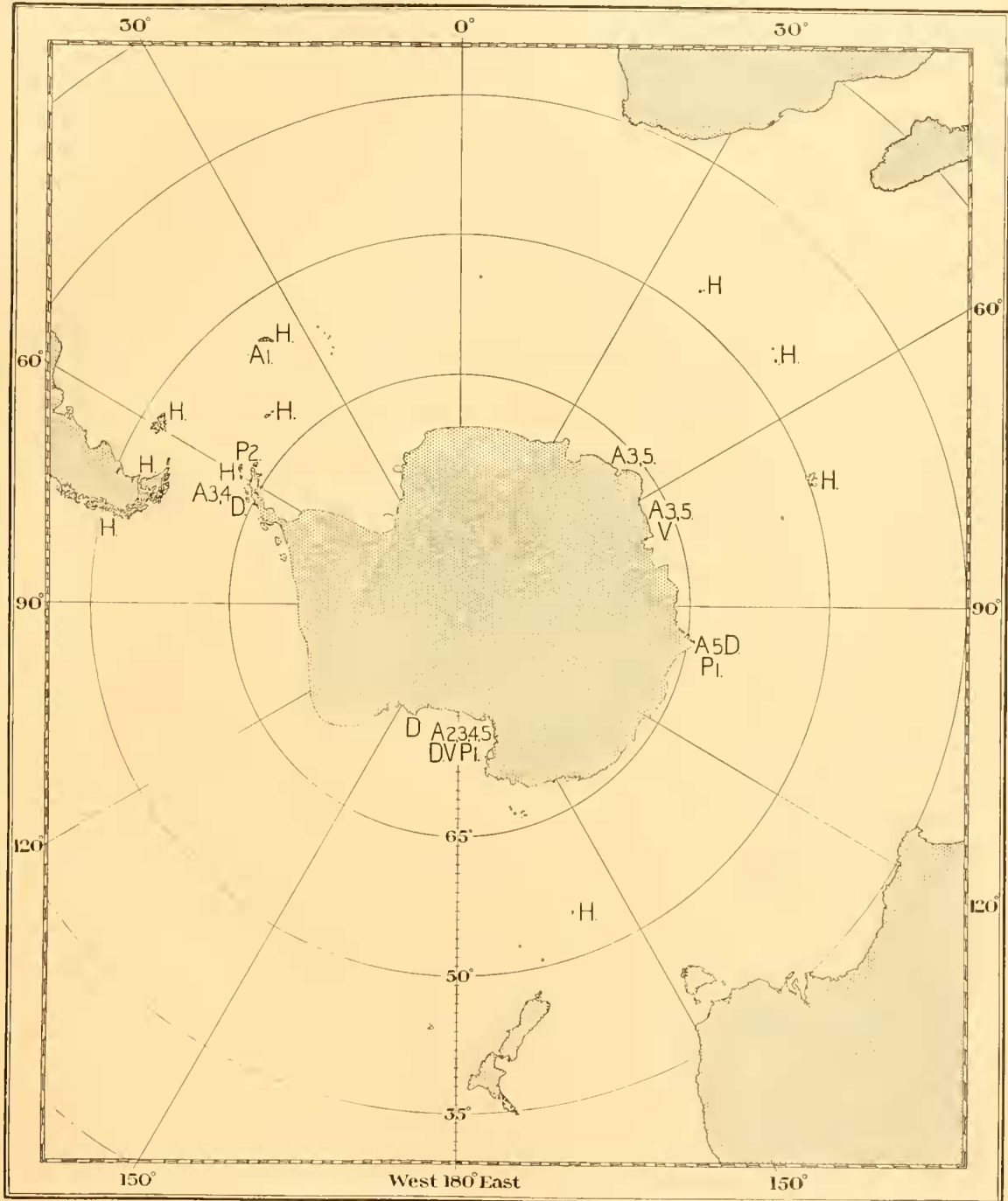


Fig. 60. Known distribution of Harpagiferidae. A 1, *Artedidraco mirus*; A 2, *A. orianae*; A 3, *A. skottsbergi*; A 4, *A. loennbergi*; A 5, *A. shackletoni*; D, *Dolloidraco longedorsalis*; V, *Histiodraco velifer*; P 1, *Pogonophryne scotti*; P 2, *P. marmoratus*; H, *Harpagifer bispinis*.

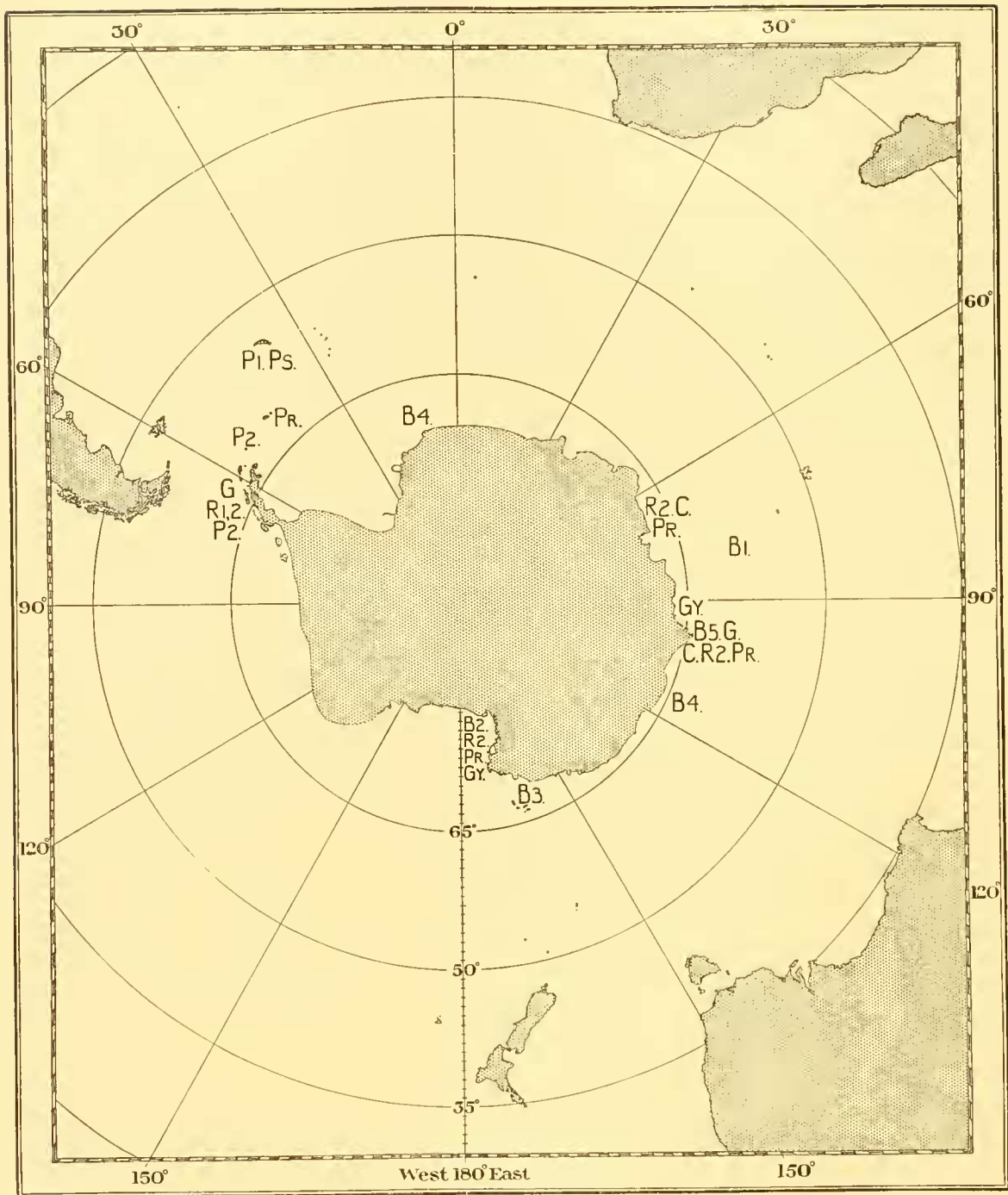


Fig. 61. Known distribution of Bathydraconidae. B 1, *Bathydraco antarcticus*; B 2, *B. marri*; B 3, *B. macrolepis*; B 4, *B. scotiae*; B 5, *B. nudiceps*; G, *Gerlachea australis*; R 1, *Racovitzia glacialis*; R 2, *R. harrissoni*; PR, *Prionodraco evansii*; C, *Cygnodraco mawsoni*; P 1, *Parachaenichthys georgianus*; P 2, *P. charcoti*; Ps, *Psilodraco breviceps*; GY, *Gymnodraco acuticeps*.

HARPAGIFERIDAE. *Artedidraco* (5 species); *Dolloidraco* (1 species); *Histiodraco* (1 species); *Pogonophryne* (2 species); *Harpagifer* (1 species).

With the sole exception of *Harpagifer bispinis*, which occurs also in the Kerguelen-Macquarie District, as well as in the Patagonian Region of the Subantarctic Zone, all the genera and species of this family are peculiar to the Glacial District.

BATHYDRACONIDAE. *Bathydraco* (5 species); *Gerlachea* (1 species); *Racovitzia* (2 species); *Prionodraco* (1 species); *Cygnodraco* (1 species); *Parachaenichthys* (2 species); *Psilodraco* (1 species); *Gymnodraco* (1 species).

All the members of this family are confined to the Glacial District. According to Regan (*t.c.*, p. 33), *Bathydraco* must be regarded as oceanic, but, in spite of their being taken mainly in deep water, it seems likely that the related genera *Gerlachea*, *Racovitzia*, and perhaps *Prionodraco*, should be reckoned as coast fishes. None of the specimens of *Bathydraco*, however, has been captured far from the coast of the Antarctic Continent. *Cygnodraco*, *Parachaenichthys*, *Psilodraco* and *Gymnodraco* are clearly to be looked upon as coast fishes.

CHAENICHTHYIDAE. *Champsocephalus* (1 species); *Pagetopsis* (1 species); *Pseudochaenichthys* (1 species); *Dacodraco* (1 species); *Chaenocephalus* (1 species); *Cryodraco* (2 species); *Chionodraco* (2 species); *Chaenodraco* (1 species).

The members of this family are highly characteristic of the Glacial District, only three species being found outside the area. Of these, the two species of *Chaenichthys* are confined to Kerguelen, and the second species of *Champsocephalus*, *C. esox*, occurs in the Patagonian Region of the Subantarctic Zone.

ZOARCIDAE. *Lycenchelys* (1 species); *Lycodichthys* (1 species); *Austrolycichthys* (3 species); *Melanostigma* (1 species).

The species of *Maynea* from South Georgia mentioned by Regan (*t.c.*, p. 34) must be removed from the list of Southern Zoarcidae (see footnote on p. 81). The species of *Melanostigma* is found also in the Subantarctic Zone. The four species of Zoarcidae from the Antarctic Continent belong to two peculiar genera, *Lycodichthys* and *Austrolycichthys*, related to the Patagonian genera *Iluocoetes* and *Austrolycus* respectively.

MURAENOLEPIDAE. This family includes a single genus, of which four species have now been described, one from the Patagonian Region, one from Kerguelen, and two from the Glacial District. One of these last (*M. microps*) has also been recorded from the neighbourhood of the Burdwood Bank, just north of the Antarctic Convergence, and, thus, outside the Antarctic Zone.

The additional collections obtained since the publication of Regan's report (1914*b*) have increased the number of species known to have a circumpolar distribution, but our knowledge of the range of many species in the Glacial District is still far too incomplete to make possible any subdivision of this area. Of the 6 species of *Notothenia* occurring on the coasts of Antarctica, only one (*N. coriiceps*) has a circumpolar distribution, whereas, of the 12 species of *Trematomus*, 7 have been recorded from both the Weddell and Victoria Quadrants. *Pleuragramma antarcticum* and *Dissostichus mawsoni* are likewise known to be circumpolar. Of the Harpagiferidae, 3 out of

9 species are known from both sides of the Antarctic, of the Bathydraconidae, 3 out of 12 species, and of the Chaenichthyidae, 2 out of 8 species.

As Regan has pointed out (*t.c.*, p. 36), the affinities of the Nototheniiform fishes found at South Georgia are predominantly Glacial, and the presence of *Notothenia larseni* near Bouvet Island suggests that this island is also rightly included within this area.

Kerguelen-Macquarie District

This district includes Marion and Prince Edward Islands, the Crozets, Kerguelen, Heard Island, and Macquarie Island. I have dealt with the fish-fauna in some detail in my report on the fishes obtained by the B.A.N.Z. Antarctic Research Expedition, but it may be of interest to summarize the conclusions here. The following table shows the distribution of the species of coastal fishes so far recorded from this district:

Table II.

	Kerguelen	Macquarie	Antipodes	Patagonia	S. Georgia	Antarctic	
<i>Raja eatonii</i>	×	.	.	.	.	.	Related to <i>R. scaphiops</i> (Patagonia)
<i>Raja murrayi</i>	×	.	.	.	.	.	Related to <i>R. macloviana</i> (Patagonia)
<i>Muraenolepis marmoratus</i>	×	.	.	.	.	.	Related to <i>M. microps</i> (mainly Antarctic)
<i>Notothenia squamifrons</i>	×	.	.	.	.	.	Related to <i>N. macrophthalma</i> (Birdwood Bank) and <i>N. larseni</i> (Antarctic)
<i>Notothenia mizops</i>	×	.	.	.	.	.	Related to <i>N. nudifrons</i> (Antarctic)
<i>Notothenia acuta</i>	×	.	.	.	.	.	Related to <i>N. angustifrons</i> (Antarctic)
<i>Notothenia marionensis</i>	×	.	.	.	.	.	Related to <i>N. angustifrons</i> (Antarctic)
<i>Notothenia cyanobranchia</i>	×	.	.	.	.	.	Related to <i>N. coriiceps</i> (Antarctic)
<i>Notothenia coriiceps</i>	×	.	.	.	×	×	
<i>Notothenia rossii</i>	×	×	.	.	×	×	
<i>Notothenia macrocephala</i>	×	×	×	×	.	.	
<i>Notothenia colbecki</i>	.	×	×	.	.	.	
<i>Harpagifer bispinis</i>	×	×	.	×	×	×	
<i>Champsocephalus gumari</i>	×	.	.	.	×	.	<i>C. esox</i> occurs in Patagonia
<i>Chaenichthys rhinoceratus</i>	×	.	.	.	.	.	
<i>Chaenichthys rugosus</i>	×	.	.	.	.	.	
<i>Zanclorhynchus spinifer</i>	×	×	.	.	.	.	
<i>Mancopsetta maculata</i>	×	.	.	×	×	.	

It is clear that, although the coastal fish-fauna of this district shows certain features of resemblance to that of the Patagonian Region and the Antipodes, its affinities are mainly with that of Antarctica.

Of the Nototheniiform fishes, the characteristic Antarctic genus, *Trematomus*, is absent from the Kerguelen-Macquarie District, but in the genus *Notothenia* the "tessellata" group so characteristic of the Patagonian Region is also wanting. Five species of *Notothenia* are peculiar to the district, all of which appear to be most nearly related to species occurring in the Glacial District, and mostly to species characteristic of the Weddell Quadrant. Of the remaining species, *N. coriiceps* and *N. rossii* are found elsewhere only in the Glacial District. *N. macrocephala*, however, occurs in both the Patagonian Region and the Antipodes, but not in the Antarctic, and *N. colbecki* in the Antipodes. *Harpagifer bispinis* occurs in the Patagonian Region as well as in the Glacial

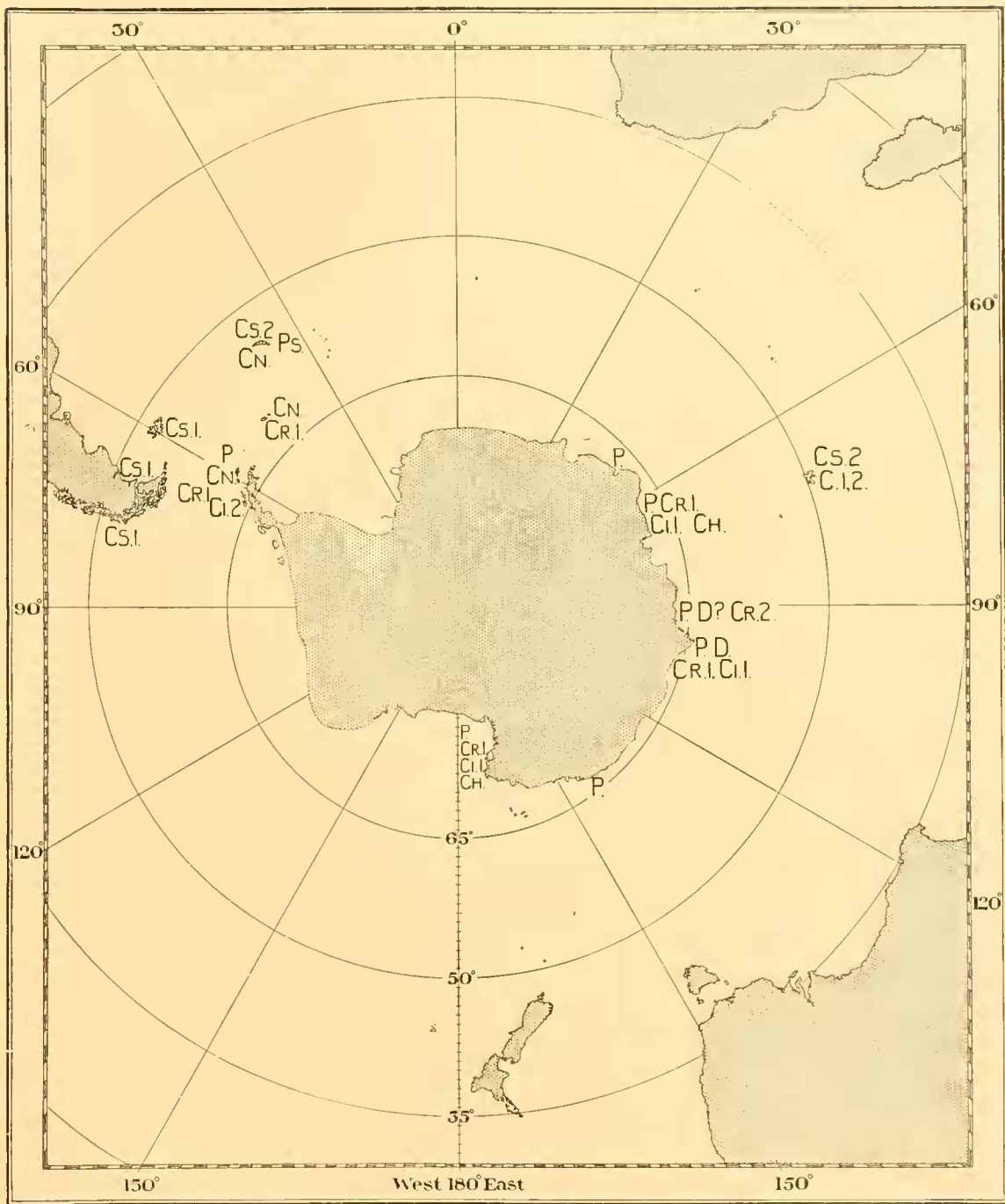


Fig. 62. Known distribution of Chaenichthyidae. Cs. 1, *Champocephalus esox*; Cs. 2, *C. gunnari*; P, *Pagetopsis macropterus*; Ps, *Pseudochaenichthys georgianus*; D, *Dacodraco hunteri*; C. 1, *Chaenichthys rhinoceros*; C. 2, *C. rugosus*; CN, *Chaenocephalus aceratus*; CR. 1, *Cryodraco antarcticus*; CR. 2, *C. pappenheimi*; CI. 1, *Chionodraco kathleenae*; CI. 2, *C. hamatus*; CH, *Chaenodraco wilsoni*.

District. *Champscephalus gunnari* is found also at South Georgia, and a related species, *C. esox*, in the Patagonian Region. *Chaenichthys* (with two species) is a genus peculiar to the island of Kerguelen, but belongs to a family, most of the members of which occur in the Glacial District.

Thus, the only way to show the dissimilarity of the fish-fauna of the Kerguelen-Macquarie District from those of the Patagonian Region and the Antipodes, and to express its affinity to that of Antarctica, is to include it in the Antarctic Zone as a separate district (Regan, 1914*b*, p. 36).

I do not propose to discuss the question of the origin of the Antarctic fish-fauna in this report, and have nothing to add to the general conclusions of Regan (*l.c.*, p. 40). As he points out, "the distinctive features of the fish-fauna... are that nearly all the genera and species are peculiar and that they nearly all belong to a single group, the Nototheniiformes, which is characteristic of and almost restricted to the Antarctic and Subantarctic Zones. In the Antarctic Zone this group has developed into a large number of types that differ greatly in structure, appearance and habits. These facts seem to point to the conclusions that Antarctica may have long been isolated and that its coasts may have been washed by a cold sea for a long time, probably throughout the Tertiary Period." Regan has also shown that neither the fresh-water fishes, nor the marine fishes, whether Antarctic or South Temperate, support the theory that the Antarctic Continent connected South America with Australia during the Tertiary Period.

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